

THE IRON AGE

THURSDAY, FEBRUARY 9, 1888.

The Saunders Pipe-Cutting and Threading Machine.

A short time ago Messrs. D. Saunders' Sons, of Yonkers, N. Y., brought out designs for a new pipe-cutting and threading machine, which embodies a number of novel and interesting features. The arrangements for building the tool for the market having just been completed, we take pleasure in presenting in this issue engravings which fully illustrate it.

The machine is turned out for driving both by hand and by power, Fig. 1 on this page, showing it as adapted for the

the frame F, and the lower part of this is fitted with one of the jaws *g* of the gripping chuck already mentioned. The opposite inner vertical edges of the frame F form guides for grooves in the upper chuck jaw *g'*. This upper jaw is suspended from the lower extremity of a screw which extends downward through the central space of a double nut. This nut is itself screwed into another nut provided in the boss at the top of the frame F. Into the inner thread of the double nut is screwed a screw bolt which may be turned as required by a hand lever, shown in Fig. 8. A bearing is provided for this screw bolt in the upper part of the cage D, and the whole arrangement

tances apart, are sockets for the receptions of sections, *a*, of a sectional nut. The inner surfaces of these nut sections are threaded to work in connection with the thread on the outside of the sleeve E. Each of the sections has attached to it a bolt which projects through a slot in a cam portion of a cam ring, J, shown in detail in Fig. 5. The heads of the bolts ride upon the outer surfaces of the cam portions, and the ring itself has sockets for the insertion of a lever, by means of which it may be revolved. When turned in one direction, the cam portions depress the nut-sections *a* so that they mesh with the screw-thread of the sleeve E, and

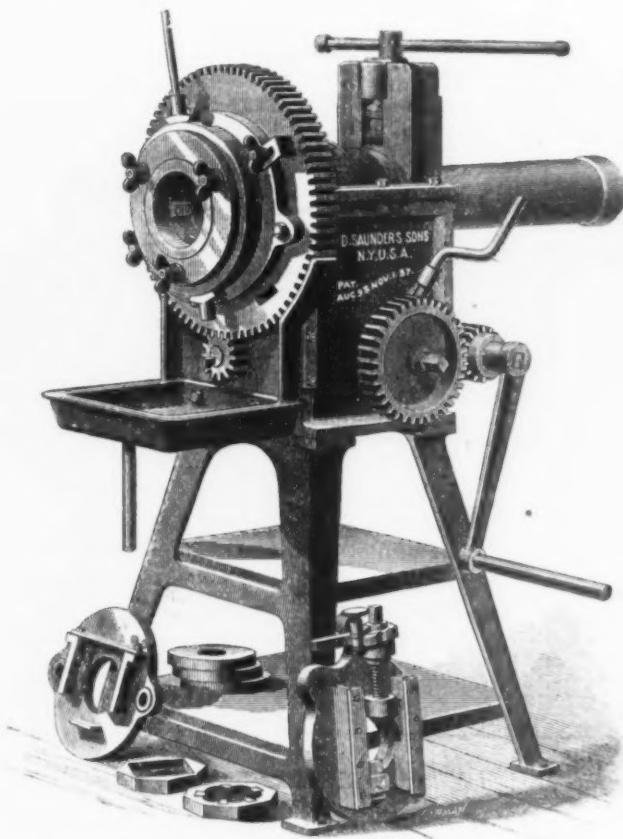


Fig. 1.—Machine for Hand Driving.

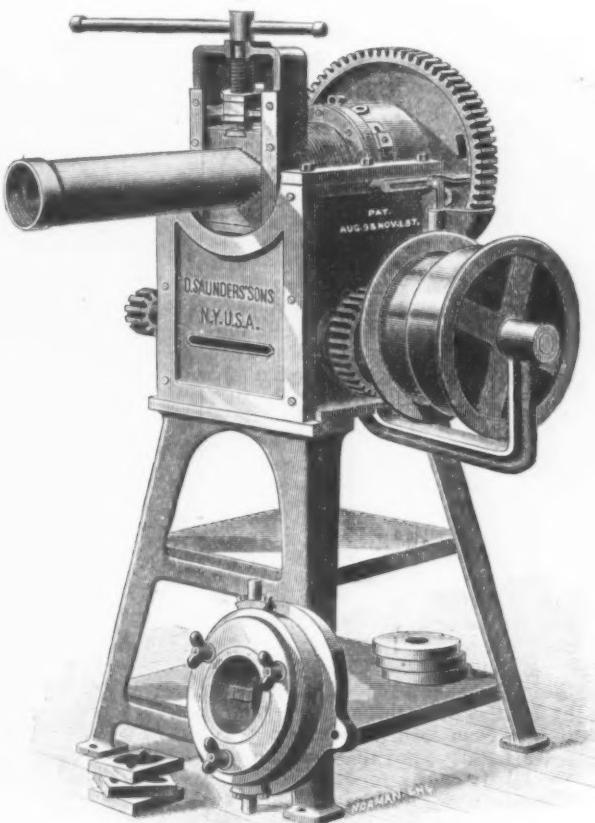


Fig. 2.—Machine with Power Attachment.

NEW PIPE-CUTTING AND THREADING MACHINE, BUILT BY D. SAUNDERS' SONS, YONKERS, N. Y.

former purpose, and Fig. 2 for the latter. There is another modification of it, however, the legs of the hand machine being left off and the tool being arranged for fastening to a bench, though in all other respects the details of construction are as those shown in Fig. 1. Reference to Figs. 3, 4, 5 and 8 on the succeeding pages will enable a ready comprehension of some of the peculiarities of the design. Fig. 3 represents an end view and partial section of a power machine. The driving shaft A is supported by a bracket and bearings in the two main standards of the machine. The inner sides of these standards have near their upper edges horizontal guides B B, into which are fitted correspondingly shaped supports, C C, on the sides of the cage D. The latter carries a chuck and also a sleeve, E (Fig. 8), which is threaded externally at its forward end and receives the pipe to be cut off or threaded. At the inner sides of the cage D are vertical guides which fit into corresponding grooves in the edges of

is such that by turning the screw bolt in one direction the frame F, and consequently the lower chuck jaw *g*, is lowered, while the upper jaw *g'* is raised in the same ratio. By turning the bolt in the reverse direction reverse motions are, of course, secured, thus admitting of moving the gripping jaws to or from each other to clasp or release the work. It is obviously an important requirement that the axis between the jaws should accurately coincide with the axis of the threading or cutting tools, and in order that both jaws may be bodily raised or lowered for this adjustment, the double nut, to which we have already referred, is provided. Turning this nut in either one direction or the other raises or lowers the frame F as may be required.

The sleeve E (Fig. 8) extends forward into another sleeve G, which is part of a face plate, as shown. The rim of this face plate is cogged, transforming the latter practically into a spur-wheel. At the inner end of the sleeve G, and at suitable dis-

enable the latter, together with the chuck connected with it, to be moved inward or outward, as the case may be, by the rotation in one direction or the other of the sleeve G—or, in other words, of the face-plate attached to this sleeve. The cam ring is kept from moving out of place toward the face-plate G by the adjacent edge of the journal H, and from moving out of place in the opposite direction by a collar, secured to the inner end of the sleeve G.

The screw-threading mechanism is secured to the face-plate, and the rotation of the latter with its sleeve causes the nut sections *a* to feed the sleeve E inward. The latter, as previously explained, carries the gripping jaws holding the work, which is thus fed along. When the requisite length of the pipe has been duly threaded, a reverse movement of the cam ring G causes the cams to lift the nut sections *a* out of contact with the thread of the sleeve E, thereby permitting the sleeve G and its face-plate to revolve without fur-

ther feeding the work. Motion is given to the face-plate G and its sleeve from a pinion, K, on the same shaft with a small bevel-wheel, which gears into a similar bevel-wheel, K', on the main shaft A (Figs. 3 and 8). The latter is provided with a spur-wheel, L (Fig. 4), which gears into a spur-pinion, L', on another shaft. This also is provided with a spur-wheel, M, which gears into a spur-pinion, M', loose on the shaft A, and which, as represented in the cut, has the cone pulleys attached.

The shaft carrying the wheels L' and M is furnished with a longitudinal feather, engaging with a groove in the pinion L', so that when the latter is brought into gear with the wheel L motion will be transmitted from the one to the other. By sliding the wheel L' along the feather, however, it may be thrown out of gear with L, allowing the latter to rotate independently. The shaft A and wheel M' are furnished with a special clutch arrangement, so that they may either be locked together or permitted to move independently of each other. When they are locked together, motion is transmitted directly from the cone pulleys (these being attached to the spur-wheel M'), to the shaft A, and from it through two bevel wheels, one of them marked K, in Fig. 8, to the face-plate G. The wheel L' (Fig. 4) should, of course, first be moved along its shaft so as to be out of gear with the wheel L. In this way a comparatively high velocity is given to the face-plate G. When less velocity and greater power are required the shaft A and wheel M' are disconnected, permitted the latter and the cone pulleys to run loose, and the pinion L' is brought into gear with the spur-wheel L. Motion is then transmitted from the pinion M' to the spur-wheel M, thence through the pinion L' and spur-wheel L to the shaft A, and thence to the bevel pinions mentioned above to the face-plate G. In order to retain the pinion L' in its two distinctive positions, a double reversible hook, S (Fig. 8), is provided. When the one claw of this hook is swung over to the shaft, carrying the pinions L' and M, it passes on the inner side of the pinion L' and keeps the latter in gear with the wheel L. When the position of the hook is reversed, the pinion L' being first brought out of gear, the opposite end of the hook is brought on the outer side of the pinion, preventing it from coming back into gear.

In order to move the sleeve E and the chuck which it carries forward and back rapidly and by hand, a rack is provided at the bottom of the cage D, and into this gears a toothed sector, the shaft of which is provided with an operating lever.

The arrangement of the cutting-off fixture is shown in Figs. 6 and 7. The opening of the face-plate G is counter-bored to receive a bushing, of which the internal diameter corresponds substantially with the diameter of the pipe to be severed. In this way support for steadyng the work is obtained. The disk P which carries the cutting-off fixture is clamped on the face-plate G in the manner shown in Fig. 6. It is fitted with guides, Q Q, for a slide, R. At one end of this slide is the cutter N, while at the other is a screw, by means of which the slide may be moved forward or backward as desired. Pivoted upon the outer end of the screw is a bar, U, its convenient attachment being secured by having its inner end forked and placed astride of the small ratchet-wheel shown more clearly in Fig. 6. The bar U is passed through a slot in the face-plate G, and projects beyond the rear surface of the face-plate. Pivoted to an adjacent portion of the frame of the machine is a swinging lever, T, under the back part of which is a fixed stud, preventing that end of the lever from swinging downward, but freely admitting of a reverse motion. The bar U is further provided with a pawl, p, engaging

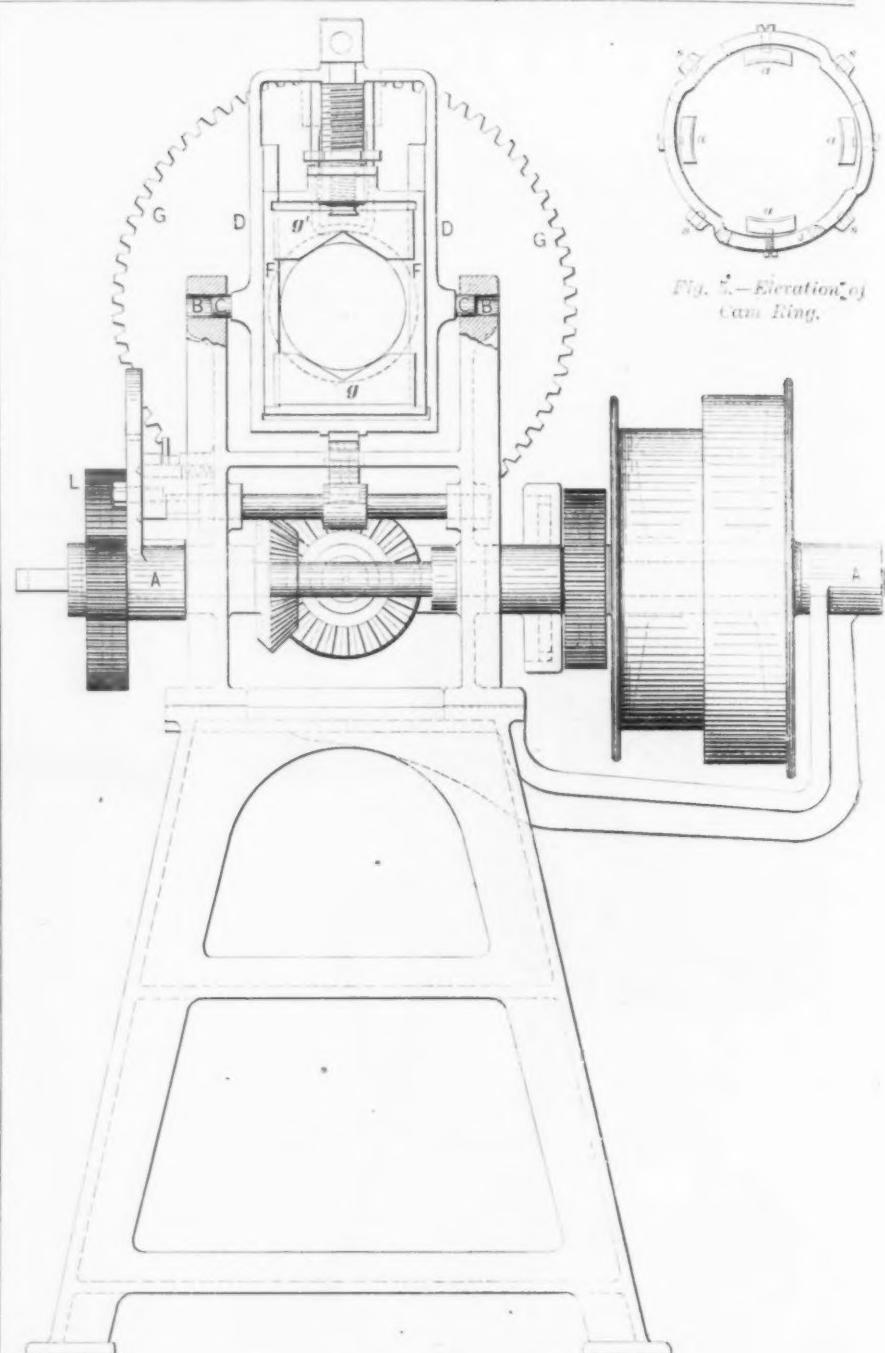


Fig. 3.—End Elevation.

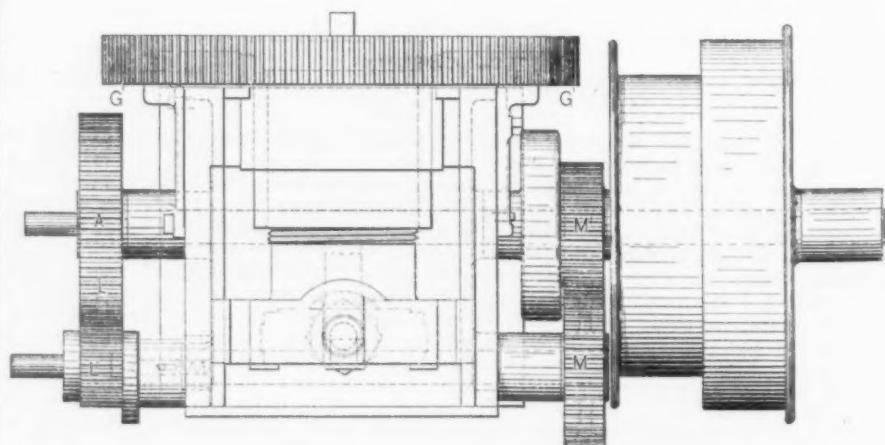


Fig. 4.—Top View.

NEW PIPE-CUTTING AND THREADING MACHINE, BUILT BY D. SAUNDERS' SONS, YONKERS, N. Y.

with the ratchet-wheel. The inner end of this pawl has two flat surfaces, substantially at right angles to each other. Behind the pawl and secured to the bar U is a spiral spring, which pushes down a flat-bottomed plunger. When the bottom of this plunger bears against the uppermost of the flat surfaces at the rear of the pawl, the pressure tends to bring and retain the

pawl in gear with the ratchet-wheel. When the pawl is turned backward, however, so as to subject the other or lowermost of the flat surfaces to the action of the plunger, the pawl is held away out of gear with the ratchet-wheel.

The pipe being placed in position, and the pawl *p* being placed in gear with the ratchet-wheel, the operation of the apparatus is as follows: The face-plate *G* being rotated carries with it the disk *P P* and its attachments, the cutter *N* being revolved around the pipe to be severed. When, in the rotation of the face-plate, the rearmost end of the bar *U* is brought under the forward end of the swinging lever *T*, the latter acts as a stop and causes the lever *U* to be carried around, the screw in the slide *R* (Fig. 7) being the fulcrum. The pawl *p* consequently acts on the ratchet, which in turn imparts motion to the screw, feeding the slide and cutter *N* inward against its work. When the bar *U* has been

thus enabling two men to work at the machine, though ample power is provided to enable one man to thread or cut 4-inch pipe. The die holder may be very quickly removed and the cut-off substituted.

The Mechanical Equivalent of Heat.

Professor De Volson Wood, of Stevens Institute, has contributed an interesting article on "The Mechanical Equivalent of Heat" to the *Railroad and Engineering Journal*.

It is now more than 40 years, says Professor Wood, since the work which is the equivalent of a given amount of heat was determined by Joule, of England. The results of those experiments were by no means uniform, but Joule, after a long series of experiments, and a patient and laborious discussion of the results, in which he seemed to give more weight to the smaller than to

those of the latter, the latter being about $\frac{1}{66}$ of the mechanical equivalent larger. But the interesting and unexpected discovery was made that the specific heat of water was greater at 40° than at 80° , and that it appeared to be a minimum near the latter point. This was contrary to the law given by Regnault's experiments, for, according to the latter, the specific heat of water increases from the melting point of ice as the temperature increases, and as this law was used by Joule in reducing the equivalent from 60°, the temperature near which his experiments were made, to its value at the temperature of ice-cold water, the resultant value would be somewhat less than the value found by direct experiment. The same remark applies to the value given by the committee of the British Association; hence, not only is 772 too small, but 774.1 is also too small.

There are physical reasons for not using the melting point of ice from which to

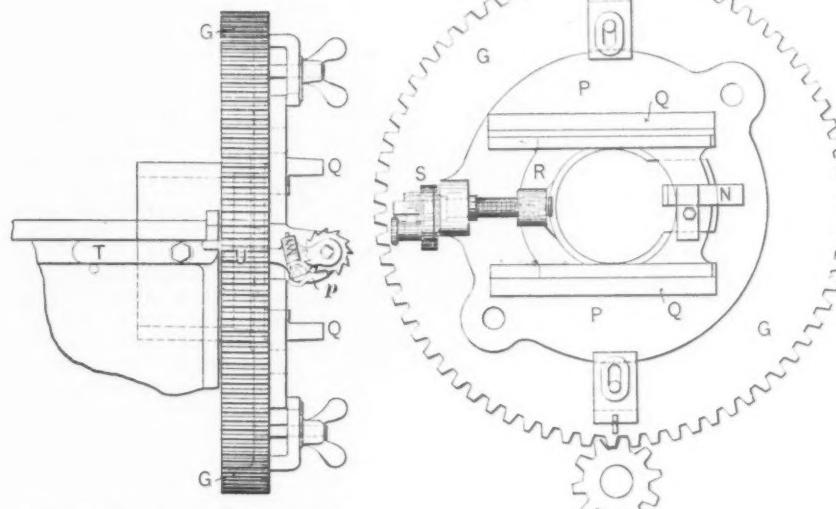


Fig. 6.—Edge View of Cutting-Off Plate.

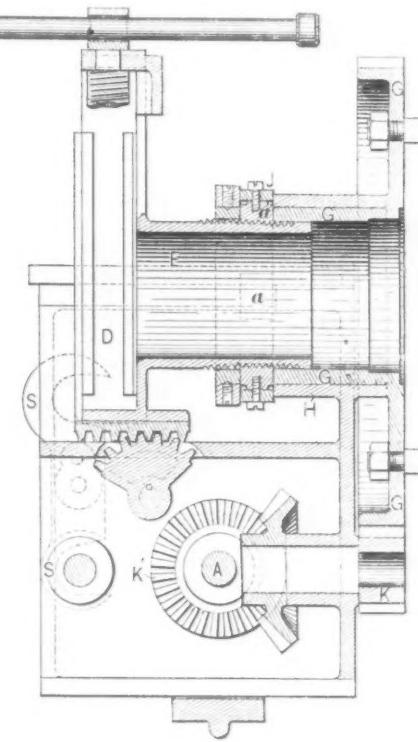


Fig. 7.—Front View of Cutting-Off Plate.

Fig. 8.—Vertical Section of the Machine.

NEW PIPE-CUTTING AND THREADING MACHINE, BUILT BY D. SAUNDERS' SONS, YONKERS, N. Y.

swung clear of the forward end of the lever *T*, it is brought back to its original position by a spring, not shown in the engravings, attached to the plate *P* and pressing against the pawl. The latter is thus brought behind one or more of the succeeding ratchet teeth preparatory to a repetition of the operation just described. If, for any reason, the direction of motion of the face-plate *G* and the fixtures attached be reversed, the rear end of the bar *U* will strike the upper instead of the lower side of the forward end of the lever *T*, and the latter will then tilt to enable the bar *U* and its adjuncts to pass without affecting their position, and consequently without causing any action on the ratchet.

The machine is capable of cutting off and threading pipe up to 4 inches diameter, admitting of the use of either solid or adjustable expanding dies. The hand machine is so arranged that the relative speeds of the crank and the large gear carrying the dies may readily be changed, thus giving to the operator whatever advantage of gearing may be necessary for the size of pipe being cut or threaded. This is done simply by changing the crank from one shaft to another, three such changes being provided for. Two cranks may also be used at the same time, one on each side,

the larger values, finally concluded that the heat energy necessary to raise the temperature of 1 pound of water 1° F. above the melting point of ice was equivalent to 772 foot-pounds of work. This value has been universally adopted by the scientific world, although more recently it has been admitted that this number is too small. In 1876 a committee of the British Association for the Advancement of Science reported to that body that the mean 60 of the best of Joule's experiments gave 774.1 foot-pounds, but this number has not yet been used, at least to any extent.

Still more recently, about 1880, Professor Rowland made a critical examination of the specific heat of water from about 40° F. to above 90° F., determining the value for each degree and the corresponding value of the mechanical equivalent. The investigation included the comparison of the air thermometer with the best mercurial thermometer, and a comparison of the mercurial thermometers used with the one used by Joule. The results of these experiments were published in the Proceedings of the American Academy of Arts and Sciences, 1880. It is observed that when Joule's experiments were reduced to Rowland's thermometer and for the latitude of Baltimore, they agree almost exactly with

measure the degree of rise of temperature. It is a critical point, and the water at that point may be absorbing heat preparatory to a change of state of aggregation. The condition of maximum density is a much more desirable point of reference. Water under the pressure of one atmosphere has a maximum density at 4° C., or 39.2° F. Omitting decimals, Rowland's investigations gave 778 as the mechanical equivalent of heat at 39.2° F., according to the mercurial thermometer, and 783 according to the air thermometer. In my recent work on thermodynamics I have used 778, not merely because that was one of the values found by Rowland, but because it agrees fairly well with the result found by other means, and also because we may, when using that number, consider the specific heat of water as constant without much error; whereas, if 783 were used, the variable specific heat ought to be taken into account. We also notice that Rowland found 778.4 for the equivalent at the latitude of Baltimore for the air thermometer when the temperature of the water was 60.8° F.

We are confident that the old number, 772, will sooner or later be abandoned and a larger value used, because nearer correct; but it remains to be seen whether 778 will

be adopted. It is apparent that for accurate scientific work the value used should be one determined in reference to the air thermometer, and for a particular degree of the scale, and all departures from uniformity—such as a variable specific heat—be determined.

Action of Sea Water Upon Cast Iron.

The results of the long-continued immersion of cast iron in sea water are well known, and examples may be found in most of the books of reference. The most frequently cited instance is perhaps that related by Berzelius of cannon balls which were raised at Carlskrona from a ship sunk for 50 years, and which had become converted through one-third of their mass into a porous graphitic substance, which became strongly heated when exposed to the air for a quarter of an hour. Mr. Carter Napier Draper, writing on the subject in the *Chemical News*, says:

The chemical change which cast iron undergoes under these circumstances is usually stated to consist in the removal of the greater part of the iron, the residue consisting of graphite and a graphitic substance, FeC_3 . I have recently been indebted to the kindness of Mr. John P. Griffith, C.E., of the Dublin Port and Docks Board, for a specimen of gray cast iron which was broken from an old rail taken from a graving slip in the port of Dublin, and believed to have been laid in 1833. The rail was at about half tide level, and it may be therefore assumed that it was for 25 years immersed in sea water, and for a like period exposed to the action of the atmosphere. The fragment of iron weighed 557.31 grms., and measured 85 by 52 mm., with a depth of 20 mm. On its lateral surfaces it was slightly incrusted with sesquioxide. The upper surface for a depth of 7 mm. had been converted into a brown-gray graphitoidal substance, which was without difficulty removed with a knife, leaving the surface of the iron bright and free from any adherent coating. During the operation of removing the easily pulverulent layer, the mass of iron became hot, not hot enough to cause inconvenience in handling, but hot enough to enable it to be very sensibly warm to the touch after the lapse of half an hour.

The quantity of altered cast iron thus removed weighed 67.59 grams, and was examined with the following results: It was wholly attracted by the magnet. Treated with dilute hydrochloric acid it evolved hydrogen, giving a pale green solution of ferrous chloride and a residue of graphite. The carbon was determined by the method of Weyl. The finely powdered substance, with excess of strong hydrochloric acid, was placed in a platinum dish, connected with the positive element of two Smeel cells, while a platinum wire terminal from the negative dipped into the liquid. After 24 hours the contents of the dish were transferred to a filter, washed, dried and weighed; 2.66 grams of substance gave a carbon residue weighing 0.631 gram = 23.6 per cent. of carbon. By the reaction with free iodine abundant evidence of the presence of unoxidized iron (doubtless existing as FeC_3) was obtained.

In connection with the widely circulated reports to the effect that grave defects had been discovered in the steel intended to be used in the construction of the cruiser Charleston at San Francisco, it is proper to explain that in the course of adjusting four of the steel deck beams it became necessary to bend them slightly in a horizontal direction at right angles to the axis, when to the surprise of the superintending constructor fractures appeared in the flanges which had been punched

with holes. Experiment demonstrated the fact that in every direction except that from which a normal stress was applied the same weakness manifested itself; but on applying a load greatly in excess of the requirements vertically from the top—that is, in the direction the beams were intended to be loaded—no appearance of weakness or disposition to fracture manifested itself, and but for the application of a strain such as could only occur in the case of a ship aground, or under other abnormal circumstances, these beams would have been regarded, and rightly, as being fully up to the requirements. Test pieces cut from the damaged beams at the Union Iron Works complied with the rigid terms of the contract in every particular, corresponding with reports received from the inspection officers at the rolling mills where the beams were manufactured.

Locomotives of the Future.

How big will locomotives be in 50 years from now? is a question which the *Railroad and Engineering Journal* discusses as follows:

D. K. Clarke's "Recent Practice of the Locomotive" contains an engraving of a Mason locomotive which was built about 30 years ago. It had 15 x 22-inch cylinders, 5½-foot wheels, and a grate 4½ feet long and 3 feet 1½ inches wide, giving a grate area of 14½ square feet. This engine weighed about 55,000 or 56,000 pounds, and had about 800 square feet of heating surface. Passenger engines recently built have from 1500 to 1600 square feet, so that it may be said that within 30 years the size and weight of passenger engines have been nearly or quite doubled. Will this rate of increase continue, and in the year 1918 will there be passenger engines running which weigh 200,000 pounds and over? There can be no doubt that the discoveries which made steel rails and steel tires possible gave a great stimulus to the increase in weight of rolling stock. Besides this, the weight of rails on main line roads has recently been increased. With a rail weighing 56 pounds per yard the maximum load per wheel which was safe and economical was about 10,000 pounds. With 72-pound steel rails loads of 15,000 and 16,000 pounds per wheel are not unusual. The speed of locomotives, however, has not been increased in the same proportion as their weight. Thirty years ago 50 and 60 miles per hour was not an uncommon maximum speed. Now 60 and 70 is about as high as we get on any of our lines. The weight of trains has probably grown as much as that of locomotives, and perhaps will continue to increase. Supposing, then, that the problem was presented to-day of making a passenger locomotive of double the weight and capacity of the largest now in use. That would mean an engine of somewhat over 200,000 pounds in weight, with a grate surface of 55 to 60 square feet, and a boiler with 3000 square feet of heating surface, and cylinders 27 or 28 inches diameter. Boilers 5 feet in diameter are now not uncommon; 7½ feet diameter would give about twice the sectional area. An eight-wheeled American engine, weighing 100,000 pounds, would have about 17,000 pounds on each wheel. Double this weight, or 34,000 pounds per wheel, would be enormous, and would require a very great increase in the weight of rails, and even then it would be very doubtful if it could be carried without crushing both the tires and the rails. By distributing this load on six or eight wheels the load per wheel would be 22,666 or 17,000 pounds, which is well within possible limits.

The experience of the last few years has shown that the height of the center of gravity is not a matter of so great importance as was formerly supposed. The first

impression is that a high locomotive is as likely to upset as a high load of hay, and it takes a considerable time and some deductive reasoning to realize fully that the vertical inequalities and horizontal deviations from a straight line which a load of hay is expected to traverse bear somewhat the same relation to those of a railroad that high mountains do to the gentle undulations of prairie country, and therefore that an elevation of the center of gravity which would be disastrous to a load of hay may be quite safe for a locomotive on a railroad. Mr. Wootten had the courage of his convictions, and elevated the centers of the boilers of his locomotives 7 feet 8 inches above the tops of the rails.

The experience with electric-light engines during the past few years has indicated what may be done with high-speed engines, and in the light of that experience it may be that wheels of smaller diameters than 5½ feet might be used, and the requisite speed be obtained by running the pistons at higher velocities than is the present practice with locomotives. This would permit the boilers to be lowered and the size of cylinders to be reduced, and, consequently, the reciprocating parts and wheels would all be smaller and lighter. This reduction in weight could then be put into the boiler, which is the source of all power.

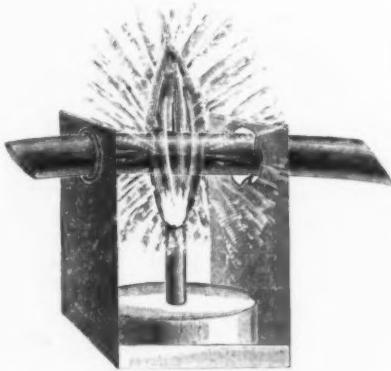
It therefore seems quite probable that the size and capacity of locomotives will continue to increase, although it is likely that there will be some modifications of the present forms of construction which will permit of the use of larger fire-boxes, and of lowering those parts whose elevation with a changed construction will not be essential. There are some sanguine people who also predict that the speed of locomotives will also be doubled in the shadowy future, into which none of us can see very far. Past experience has not shown an increase in speed corresponding with that of the weight and capacity of locomotives. The reason is not difficult to find. The capacity of a locomotive—that is, the load it can pull at a given speed—is proportionate to its weight—that is, an engine twice as heavy will pull a train of double the weight. There is a physical law which unfortunately prevents the fulfillment of the predictions of the sanguine prophets of speed—that is, that the resistance of trains increases as the square of the velocity—probably at even a higher ratio at high velocities; and what adds to the difficulty is that when the amount of work is thus increased it must be done in less time. Thus at 60 miles an hour the resistance is roughly twice as great as it is at 40 miles, and the work must be done in two-thirds of the time. This law stands in the way of an increase in speed beyond limits which are soon reached in practical service.

At the recent meeting of the American Society of Civil Engineers, the committee on uniform standard time reported that the 24-hour system is making satisfactory progress. It has been adopted on 2600 miles of the Canadian Pacific Railway, and will gradually be extended over the whole of that system; it has also been adopted on sections of the Canadian Government railways and other lines on this continent, on some European lines, and in Japan.

The Zalinski dynamite gun has attracted much attention abroad as well as in this country, and has been the subject of much discussion among foreign naval authorities. The first actual order from Europe, we believe, is one from the Italian Government, which is for a gun capable of throwing a projectile weighing 600 pounds. This is to be used for experimental purposes; if successful, a number of the guns will probably be ordered.

Randall's Fuse Lighter.

We illustrate in the annexed cut a simple device, the utility of which will be appreciated by those who are familiar with the practical details of mining operations. It is intended to hold the end of a fuse in place so that it will be sure to be ignited. It consists of a single piece of tin plate, bent so that the ends form uprights $1\frac{1}{4}$ inches high. The base is 1 inch square. On the open sides a small piece of tin plate is left, which turns up about $\frac{1}{8}$ inch—



Randall's Fuse Lighter.

enough to hold in place a bit of candle inserted to light the fuse. Holes are made in the uprights for the fuse to pass through, one of the holes being circular and the other having three points projecting into it to hold the fuse tight. The advantage of such an arrangement over the ordinary methods of placing a candle and arranging the fuse is obvious. The claim is that it saves a great deal of the miner's valuable time, as well as making it almost impossible for the shot to miss. The manufacturers are Randall & Porter, 159 Washington street, Chicago, Ill.

Raising Fire-Boxes Above the Frames.

The demand for increased grate area for locomotive fire-boxes, says the *National Car and Locomotive Builder*, has within the last few years led to a great extension of the practice of raising the foundation ring of the fire-box above the frames, so that the whole width between the driving wheels might be utilized for extending the fire-box. This form of construction had obtained wide application for anthracite coal-burning locomotives years ago; but it was not till quite recently that the arrangement became recognized as entirely applicable to bituminous coal-burning engines. There was long an impression among those who were regarded as authority on matters pertaining to combustion in locomotive fire-boxes that the shallow fire-box inherent to the practice of raising the grate above the frames was not adapted to burn coal containing volatile gases in large quantities. They maintained that the gases released from bituminous coal needed considerable space where admixture with the oxygen of the air could be completed before they passed into the tubes, and that the shallow fire-box did not provide this space; hence the gases would pass away unconsumed. Undeterred by this plausible theory, some radical designer tried the shallow fire-box for soft coal, and it worked so successfully that this form of construction is rising rapidly into favor.

The Chicago, Alton and St. Louis mogul locomotives are reported to be as economical freight engines as ever were run in the West, and a considerable share of the saving in coal is said to result from the ample grate area permissible through the grates being placed above the frames. This is also a notable feature in the Chicago,

Burlington and Quincy mogul for passenger service. The first soft coal locomotive that we remember seeing with the fire-box above the frames was a group of moguls built by the Schenectady Locomotive Works for the Fall Brook Coal Company. Mr. Foster, master mechanic of the road, was so enthusiastic in his praises of these engines, that he doubtless influenced others to try them. We have found no road using engines with the grates above the frames where the arrangement is not giving entire satisfaction, and that indicates that the change will make rapid headway upon the locomotives of the future.

Ladle for Running Lead Joints.

London Engineering illustrated and described, a short time ago, a combined melting pot and ladle for running lead joints in cast-iron pipes. From the published illustrations we have prepared the annexed engraving, which represents a vertical section of the ladle and, at the same time, shows it mounted on a stool which is made to fit the pipe, thus simplifying the operation of casting.

It will be noticed that at the bottom of the ladle is a valve of cast iron fitted with an asbestos face and operated by a vertical rod and pivoted lever. The latter is normally locked by a wedge, W, to keep the valve on its seat. When a joint is to be run the pot is placed over it, and the valve is raised. The hot metal immediately flows past the valve into the joint, the light scum remaining on the surface, and the heavy dross, if there be any, lying in the bottom of the pot below the valve seat. For double joints, as in running collars on to two spigot ends, two valves are placed in the ladle at the proper distance apart for the two joints, and are

streets, and many of them being at a considerable distance from the main office. The Baldwin works have, from small beginnings, built up by far the largest business of the kind in the world.

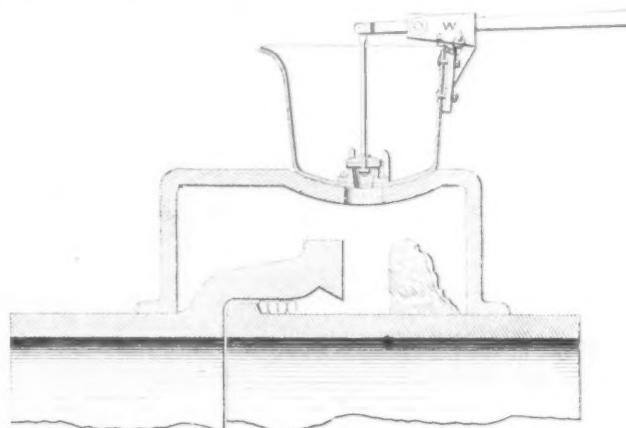
Steel for Welded Pipe and Boiler Tubes.*

BY THOMAS J. BRAY.

"For a number of years past experiments have been made with steel as a material for the manufacture of welded pipe and boiler tubes, but with varying and unsatisfactory results. The writer having made many professional attempts to substitute steel for iron, and being familiar with the failures of others in that direction, he was therefore ready to raise the stereotyped objections to the use of that metal for welded tubing whenever the subject would be brought to his notice. Early in the spring of 1887 the owners of the Riverside Iron Works, of Wheeling, W. Va., decided to build and operate a tube works for the purpose of utilizing, in the manufacture of iron pipe, the product of their rolling mill and forge plant, which had then laid idle for about three years by reason of the substitution of steel for iron in the manufacture of nails.

"During the progress of the construction of the tube works the general manager of the company, Mr. Frank J. Hearne, discussed with the writer the possibilities of steel as a material for pipe-making, the writer using the following objections to its use:

"It won't do, for I have tried it repeatedly and failed. It won't stand the amount of heat required to weld it. It cannot be threaded satisfactorily, as it is very destructive to the threading tools. It is also entirely too irregular in its character."



LADLE FOR RUNNING LEAD JOINTS.

raised together or separately. In case an explosion is feared from a damp joint, the handle may be lengthened by a piece of pipe, and the operator stand at a safe distance. The ladles are made by the Glenfield Company, Kilmarnock, in twelve sizes, varying in capacity, for single ladles from $\frac{1}{2}$ cwt. to 3 cwt., and for double ladles from 1 cwt. to 4 cwt. Their advantages are manifest to all, and cannot fail to recommend them.

The Baldwin Locomotive Works, at Philadelphia, have recently completed their 9000th engine. Such an enormous output from works is highly creditable to any firm, and is especially remarkable when it is borne in mind that the works were not originally laid out for building modern locomotives, and that they labor under some consequent disadvantages, the individual shops being separated by public

"These objections did not even strike Mr. Hearne as being serious or insurmountable, for he then stated that he was sure that they could be overcome, and he believed he could furnish a grade of steel skelp that would not have the above faults to any appreciable degree. It was then decided that when the tube works would be in full operation making iron pipe, to put the matter to a practical demonstration.

"Toward the latter part of August about thirty tons of steel were made and rolled into skelp and delivered at the tube works as a trial lot, to be made into pipe. It was not necessary to brand or mark this material in any way, for the veriest tyro could distinguish it from iron, either in the strip, skelp or pipe, by its clean, smooth and fine appearance. The welders at the furnaces said, at the outset, that it

*A paper read before the Engineers' Society of Western Pennsylvania, Pittsburgh, January 17.

would not do; that it would not stand fire; and by reason of their prejudices against steel they subjected it to abuse by severe overheating; yet, strange to say, every piece of that lot made a sound, saleable pipe, the welders remarking that 'it was the best material to weld they had ever handled.' It was threaded and finished with the same success as it was welded. Of course we all thought that this was a 'fancy lot' or a 'happy hit,' the writer reporting that it was just the material for the purpose, and far ahead of iron in every particular.

"Soon after this several lots of 100 tons each were made, and a record kept of the loss in the furnaces, crop ends, leakers, &c., which proved to be so very favorable to the use of steel for pipe-making that the company decided to manufacture steel pipe exclusively, and to abandon the use of their forge and iron-making plant altogether.

"Since the first introduction of Riverside steel tubing thousands of tons have been made and sold with great satisfaction to the users thereof, and we are advised by parties in the East that they are using our standard steel pipe for hydraulic purposes at a pressure of 1000 pounds per square inch with success. The steel is made in a Bessemer converter, the chemical analysis I am unable to give correctly at present; but regarding its physical properties can unhesitatingly say that it is the smoothest, toughest and kindest material to work with and to weld into pipe that has ever been tried or used by the writer. It is made at the Riverside Steel Works by Mr. E. L. Wiles, a graduate of Stevens Institute of Technology.

"The accompanying samples, cut from ordinary Riverside steel pipe, clearly show the character of the material in the cold and hot states. The cold samples were flattened under a steam hammer. The washer was made out of a piece of 4-inch steel pipe, 1½ inches long, by a blacksmith, by turning one edge of the pipe inward and flanging it on the other edge, then flattening it out into a washer, as shown. The two goblets were made out of 2-inch and 4-inch pipe respectively, necked down and welded to form a leg or stem, then flanged out for foot and mouth. This was done to show the amount of punishment the material can stand in a heated condition.

"Please notice the butt-welded samples particularly. It is well known that very little pressure is exerted on the edges of the same in making butt-welded pipe, hence the weld is not a very strong one usually. There is considerable loss in iron butt-weld pipe by its splitting in the weld on being tested to the regulation pressure of 3000 pounds per square inch. With steel pipe this loss is reduced to less than 1 per cent. by reason of the superior welding qualities of this steel over iron. I inclose with the samples a few crop ends. These show plainly how little is lost on each end with steel, and how well and kindly it welds. So flattering have been the reports from the users of this pipe that we can unhesitatingly pronounce it a merchantable success."

Messrs. A. R. Whitney & Co., of this city, to whom we are indebted for a copy of the above paper, also give us the following extracts from a letter of Mr. Frederick R. Williams, Chemist to the General Manager of the Riverside Iron Works:

"It would seem that the steel being homogeneous in structure and free from flaws and minute interstices and uniform in its composition should be less readily acted upon than wrought iron with its fibrous structure, and less homogeneous character. Furthermore, tests have been made and recorded which showed that in the cases under investigation both hard and soft Bessemer steel were more slowly dissolved by the action of dilute sulphuric

and nitric acids than were either wrought iron plate or common cast iron. In a series of experiments at Terre Noire extending over three years it was found that the corrosive effect of sea water was more than twice as great upon wrought-iron plates as upon soft steel. In regard to the steel sink in my laboratory, I can only say that it has been in use four years and is apparently in good condition still. Into it are constantly pouring waters, sometimes acids, sometimes alkaline, and it has also to endure the corrosive fumes which are commonly prevalent in a laboratory during working hours."

Drawbacks on Imported Wire Rods.

A firm of barb-wire manufacturers have addressed the following letter to Hon. Roger Q. Mills, chairman of the Ways and Means Committee of the House: "We are exporters of barb wire, manufactured from imported wire rods and spelter. In its sale we are brought into direct competition with manufacturers in Germany and England—and labor under many comparative disadvantages—such as cost of ocean freight on material inland, freight from New York to factory and return to New York, higher rate of wages, higher freights from New York than from Hamburg or London, to consuming countries, *et cetera*. In addition to these we have to lose 10 per cent. of duty paid on materials. We would therefore ask you to incorporate in the proposed new tariff bill a provision that on exported articles made entirely from imported materials the entire amount of duty collected on such material shall be refunded to the exporters.

We do not instance other exported articles than barb wire because not directly interested in them nor definitely consonant with their details; but we believe a like hardship is worked to all who make similar exportations. It is clear that the retention by the United States Government of 10 per cent. of duty paid acts directly for the protection of foreign labor and manufacturers—and that is constantly adding to a revenue and surplus which is already unnecessarily large. We are not petitioning protection, nor seeking subsidies, but only ask that in a severe competition in the markets of the world our Government shall not impose a tax which provides a revenue that is not needed, which acts as an incubus on American labor and capital, and whose sole benefit inures to manufacturers in foreign lands. In such a conflict as we are engaged in, it is not unreasonable for us to ask a fair field and no favor.

A 10-wheel freight engine on the Burlington, Cedar Rapids and Northern has been equipped with a new valve motion, the Grimes valve gear, which will be subjected to a series of tests at Cedar Rapids, Iowa. It is claimed that the results of working show an additional hauling capacity of about 20 per cent., with a saving in fuel. It is also stated that the valves can be re-set very readily. No changes are made in the valves or cylinders, and the mechanism used on each cylinder consists of one eccentric, a slide block with the eccentric rod attached midway to the strap, thus obtaining the combined horizontal and vertical motion necessary to give varying travel and cut-off. An offset rocker arm and a radius bar of the same length, and attached near the same points as the eccentric rod, is used to overcome the vertical motion of the frame in relation to the axle.

The London *Engineer* records the safe arrival at Guayaquil of a torpedo boat lately completed by Messrs. Yarrow & Co. for the Republic of Ecuador, a distance of 10,670 miles. Advice has also been re-

ceived of the safe arrival at Hong Kong of the torpedo boat lately built by the same firm for the Chinese Government. These two voyages serve as an additional proof of the thorough sea-going qualities of vessels of this class.

New Methods of Preparing Hydrogen and Hydrogen Peroxide.

According to Dingler's *Polytechnisches Journal* it has been observed by Williams that zinc dust gives off hydrogen when heated. He obtained from 6.479 grams of zinc dust 37.5 c. cm. hydrogen. When the hydrogen was passed over ignited cupric oxide 0.0365 grams water were obtained, of which only 0.0055 grams were contained in the zinc dust employed. The experimenter formed the opinion that the hydrogen was formed in the zinc dust by the decomposition of water, and subsequently experimental evidence was adduced by him to prove that this is the case. Williams observed that zinc dust gave off particularly large quantities of hydrogen when it was previously moistened with water and dried to constant weight at 100° C. By this means 6.479 grams zinc dust took up 0.1924 grams water, and the quantity of hydrogen evolved on ignition was 89.4 c. cm.

The observations of Williams were further developed by Schwarz (*Berich d. Deutsh Chem. Gesel*), who devised a very convenient method for preparing hydrogen by means of zinc dust. This depended upon the mutual reaction between zinc dust and calcium hydroxide, obtained by moistening burnt lime with a little water, sifting and drying at 100° C. On moderately heating a regular evolution of hydrogen occurs according to the following equation: $Zn + Ca(OH)_2 = ZnO + CaO + H_2$ 20 grams of zinc dust, with 22.8 grams calcium hydroxide give 5200 c. cm. dry hydrogen at 0° and 760 mm., corresponding to 0.466 grams water. As, however, the mixture of zinc dust and calcium hydroxide cannot be kept at any length of time, owing to the occurrence of the reaction at ordinary temperatures, the mixture cannot be utilized for military purposes necessitating the rapid filling of balloons.

W. Massert and G. Richter hope, however, to overcome this defect by heating the calcium hydroxide to about 300° C. to expel all hydroscopic moisture before mixing it with zinc dust. When treated in this way the mixture does not evolve hydrogen even at 100° C., but only just before a red heat is reached. Magnesium hydroxide, calcium chloride, or the double compound of calcium and magnesium chlorides, sodium or potassium chlorides are said to give better results than calcium hydroxide. The process given by Schoenbein for the preparation of hydrogen peroxide by the slow oxidation of metallic amalgams with water, acid and air has been technically employed by S. Lustig in the manner described under:

Zinc amalgam is shaken up with air and alcoholic solution of sulphuric acid prepared by mixing 96 volumes of absolute alcohol with four volumes of dilute sulphuric acid (25%). After shaking half an hour, 40 c. cm. of the dilute are added for every liter of liquid present, to avoid the consumption of the acid, and the shaking is continued for an equal time. The sulphates thus formed, which are almost insoluble in alcohol, are allowed to settle, and separated completely by decantation and filtration. The liquid then contains 3 to 3.4 grams of hydrogen peroxide per liter. By distilling off the alcohol in vacuo the liquid is concentrated and the hydrogen peroxide obtained in aqueous solution. The use of alcohol instead of water in this process of oxidation is attended by the advantages—first, that the destruction of

the hydrogen peroxide by the oxidizing body is prevented, a much higher concentration of hydrogen peroxide in the liquid being thus obtained; secondly, that the evaporation and concentration of the liquid is facilitated; thirdly, that most of the salts formed are insoluble in, and precipitated from, the alcohol, and, fourthly, that a similar consumption of materials is possible.

Improved Bar Folder.

The Niagara Stamping and Tool Company, of Buffalo, N. Y., are putting on the market a new and improved modification of the well-known bar folder for sheet metal. The engraving which we annex will explain the principal features of the new design.

The gauge, it should be noted, has an open slide to which the gauge-piece proper is attached. This slide moves in the ex-

folders had the journals on the bar broken simply because the machine had no means of adjustment. To overcome this objection, the frame of the machine is provided with two buttons upon which the set-screws of the shoes rest. These buttons are eccentrics or cams, and raise or lower, as desired, the shoes by turning them in either one or the other directions. The buttons are marked IC, IX, XX, so that, by turning the proper side up the clamp is properly adjusted for the thickness of tin to be folded. This part of the operation requires but a second or two to perform.

Suggestions to Steel Workers.*

On Annealing.—Owing to the fact that the operations of rolling or hammering steel make it very hard, it is frequently necessary that the steel should be annealed

steel is scaled in this way, and then, because it does not cut well, it is customary to heat it again, and hotter still to overcome the trouble, while the fact is, that the more this operation is repeated, the harder the steel will work, because of the hard scale and the harsh grain underneath. Third—a high scaling heat, continued for a little time, changes the structure of the steel, destroys its crystalline property, makes it brittle, liable to crack in hardening and impossible to refine.

Again, it is common practice to put steel into a hot furnace at the close of a day's work, and leave it there all night. This method always gets the steel too hot, always raises a scale on it, and worse than either, it leaves it soaking in the fire too long, and this is more injurious to steel than any other operation to which it can be subjected.

A good illustration of the destruction of crystalline structure by long continued heating may be had by operating on chilled cast iron.

If a chill be heated red hot and removed from the fire as soon as it is hot, it will, when cold, retain its peculiar crystalline structure; if now it be heated red hot, and left at a moderate red for several hours; in short, if it be treated as steel often is, and be left in a furnace over night, it will be found, when cold, to have a perfect amorphous structure, every trace of chill crystals will be gone, and the whole piece be non-crystalline gray cast iron. If this is the effect upon coarse cast iron, what better is to be expected from fine cast steel?

A piece of fine tap steel after having been in a furnace over night will act as follows:

It will be harsh in the lathe and spoil the cutting tools.

When hardened it will almost certainly crack; if it does not crack it will have been a remarkably good steel to begin with. When the temper is drawn to the proper color and the tap is put into use, the teeth will either crumble off or crush down like so much lead.

Upon breaking the tap, the grain will be coarse and the steel brittle.

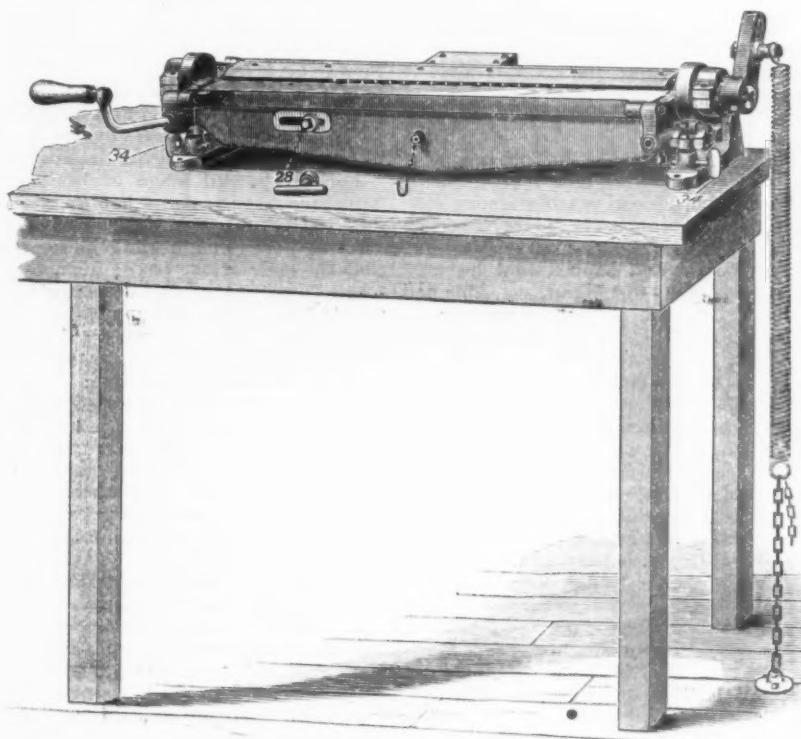
To anneal any piece of steel, heat it red hot; heat it uniformly and heat it through, taking care not to let the ends and corners get too hot.

As soon as it is hot, take it out of the fire, the sooner the better, and cool it as slowly as possible. A good rule for heating, is to heat it at so low a red that when the piece is cold it will still show the blue gloss of the oxide that was put there by the hammer or the rolls.

Steel annealed in this way will cut very soft; it will harden very hard, without cracking, and when tempered it will be very strong, nicely refined and will hold a keen, strong edge.

Forge Steel.—Fully as much trouble and loss are caused by improper heating in the forge fire as in the tempering fire, although steel may be heated safely very hot for forging if it be done properly, but any high degree of heat, no matter how uniform it may be, is unsafe for hardening.

The trouble in the forge fire is usually uneven heat, and not too high heat. Suppose the piece to be forged has been put into a very hot fire and forced as quickly as possible to a high yellow heat, so that it is almost up to the scintillating point. If this be done, in a few minutes the outside will be quite soft and in nice condition for forging, while the middle parts will be not more than red hot. The highly heated soft outside will have very little tenacity—that is to say, this part will be so far advanced toward fusion that the particles will slide easily over one another, while the less highly heated inside parts will be hard, possessed of high tenacity, and the particles will not slide so easily over each other.



IMPROVED BAR FOLDER, BUILT BY THE NIAGARA STAMPING AND TOOL COMPANY, BUFFALO, N. Y.

tension shown in the cut, and has a gib and set-screws for perfect adjustment. The gauge is operated by the usual side-screw with which it is connected by a link in a peculiar but positive manner. By this arrangement the makers claim to produce a gauge that is absolutely correct, and cannot fold an edge wider on one end than on the other. The wedge for adjusting the wing for the folder bar has a rack cut into its body, engaged by a pinion, U. This pinion is operated by the same wrench that engages the wedge-screw marked 28. A socket is formed on each side of the folder bar so that the handle can be used by either the right or left hand. A bar folder, when used all day long, is a very tiresome machine to operate. By changing the handle both hands can alternately be brought into requisition. By means of the spring device for counter-balancing the bar the weight of the folder bar is perfectly equalized, so that no effort whatever, it is claimed, is required to operate these folders.

Heretofore no means for rapid adjustment of the jaw for different thicknesses of metal have been devised, and many

before it can be conveniently cut into the required shapes for tools.

Annealing or softening is accomplished by heating steel to a red heat and then cooling it very slowly, to prevent it from getting hard again.

The higher the degree of heat, the more will steel be softened, until the limit of softness is reached when the steel is melted.

It does not follow that the higher a piece of steel is heated the softer it will be when cooled, no matter how slowly it may be cooled; this is proved by the fact that an ingot is always harder than a rolled or hammered bar made from it.

Therefore, there is nothing gained by heating a piece of steel hotter than a good bright cherry red; on the contrary, a higher heat has several disadvantages: First—if carried too far, it may leave the steel actually harder than a good red heat would leave it. Second—if a scale is raised on the steel, this scale will be harsh, granular oxide of iron, and will spoil the tools used to cut it. It often occurs that

* From a pamphlet entitled "Condensed Suggestions to Steel Workers," issued by Miller, Metcal & Parkin, Pittsburgh.

Now let the piece be placed under the hammer and forged. The soft outside will yield so much more readily than the hard inside that the outer particles will be torn asunder, while the inside will remain sound, and the piece will be pitched out and branded "burned."

Suppose the case to be reversed and the inside to be much hotter than the outside—that is, that the inside shall be in a state of semi-fusion, while the outside is hard and firm.

Now let the piece be forged. The outside will be all sound and the whole piece will appear perfectly good until it is crooked, and then it is found to be hollow inside, and it is pitched out and branded "burst."

In either case, if the piece had been heated soft all through, or if it had been only red hot all through, it would have forged perfectly sound and good.

If it be asked, Why then is there ever any necessity for smiths to use a low heat in forging, when a uniform high heat will do as well? we answer—

In some cases a high heat is more desirable to save heavy labor, but in every case where a fine steel is to be used for cutting purposes it must be borne in mind that very heavy forging refines the bars as they slowly cool, and if the smith heats such refined bars until they are soft, he raises the grain, makes them coarse, and he cannot get them fine again unless he has a very heavy steam hammer at command and knows how to use it well.

In following the above hints there is a still greater danger to be avoided: that is incurred by letting the steel lie in the fire after it is properly heated. When the steel is hot through it should be taken from the fire immediately and forged as quickly as possible.

"Soaking" in the fire causes steel to become "dry" and brittle, and does it more injury than any bad practice known to the most experienced.

On Temper.—The word temper, as used by the steel-maker, indicates the amount of carbon in steel; thus, steel of high temper is steel containing much carbon; steel of low temper is steel containing little carbon; steel of medium temper is steel containing carbon between these limits, &c. Between the highest and the lowest we have some 20 divisions, each representing a definite content of carbon.

As the temper of steel can only be observed in the ingot, it is not necessary to the needs of the trade to attempt any description of the mode of observation, especially as this is purely a matter of education of the eye, only to be obtained by years of experience.

The act of tempering steel is the act of giving to a piece of steel, after it has been shaped, the hardness necessary for the work it has to do. This is done by first hardening the piece, generally a good deal harder than is necessary, and then toughening it by slow heating and gradual softening until it is just right for work.

A piece of steel properly tempered should always be finer in grain than the bar from which it is made. If it is necessary, in order to make the piece as hard as is required, to heat it so hot that after being hardened it will be as coarse, or coarser in grain than the bar, then the steel itself is of too low temper for the desired work. In a case of this kind, the steel-maker should at once be notified of the fact, and could immediately correct the trouble by furnishing higher steel.

If a great degree of hardness is not desired, as in the case of taps and most tools of complicated form, and it is found that at a moderate heat the tools are too hard and are liable to crack, the smith should first use a lower heat in order to save the tools already made, and then notify the steel-maker that his steel is too high, so as to prevent a recurrence of the trouble. In

all cases where steel is used in large quantities for the same purpose, as in making of axes, springs, forks, &c., there is very little difficulty about temper, because, after one or two trials, the steel-maker learns what his customer requires, and can always furnish it to him.

In large, general works, however, such as a rolling mill and nail factory, or large machine works, or large railroad shops, both the maker and worker of the steel labor under great disadvantages from want of a mutual understanding.

The steel maker receives his order and fills the sizes, of tempers best adapted to general work, and the smith usually tries to harden all tools at about the same heat. The steel-maker is right, because he is afraid to make the steel too high or too low for fear it will not suit, and so he gives an average adapted to the size of the bar.

The smith is right, because he is generally the most hurried and crowded man about the establishment. He must forge a tap for this man, a cold nail knife for that one, and a lathe-cutter for another, and so on; and each man is in a hurry.

Under these circumstances, he cannot be expected to stop and test every piece of steel he uses, and find out exactly at what heat it will harden best and refine properly.

He needs steel that will all harden properly at the same heat, and this he usually gets from the general practice among steel makers of making each bar of a certain temper, according to its size.

But if it should happen that he were caught with only one bar of, say, inch and a quarter octagon, and three men should come in a hurry, one for a tap, another for a punch, and another for a chilled roll plug, he would find it very difficult to make one bar of steel answer for all of these purposes, even if it were of the very best quality.

The chances are that he would make one good tool and two bad tools; and when the steel maker came around to inquire, he would find one friend and two enemies, and the smith puzzled and in doubt.

There is a perfectly easy and simple way to avoid all of this trouble, and that is to write after each size the purpose for which it is wanted, as, for instance: track tools, smith tools, lathe tools, taps, dies, cold nail knives, cold nail dies, hot nails, hot or cold punches, shear knives, &c. This gives very little trouble in making the order, and it is the greatest relief to the steel maker. It is his delight to get hold of such an order, for he knows that when it is filled he will hardly ever hear a complaint.

Every steel maker worthy of the name knows exactly what temper to provide for any tool, or, if it is a new case, one or two trials are enough to inform him, and as he always should have 20 odd tempers on hand it is just as easy—and far more satisfactory to both parties—to have it made right as to have it made wrong.

For these reasons we urge all persons to specify the work the steel is to do, then the smith can harden all tools at about the same heat, and he will not be annoyed by complaints or hints that he does not do his work well.

On Heating.—Owing to varying instructions on a great many different labels, we find at times a good deal of misapprehension as to the best way to heat steel; in some cases this causes too much work for the smith, and in other instances disasters follow the act of hardening. There are three distinct stages, or times of heating:

First, for forging.

Second, for hardening.

Third, for tempering.

The first requisite for a good heat for forging is a clean fire and plenty of fuel, so that jets of hot air will not strike the corners of the piece; next, the fire should

be regular, and give a good uniform heat to the whole part to be forged. It should be keen enough to heat the piece as rapidly as may be, and allow it to be thoroughly heated through without being so fierce as to overheat the corners.

Steel should not be left in the fire any longer than is necessary to heat it clear through, as "soaking" in fire is very injurious; and, on the other hand, it is necessary that it should be hot through to prevent surface-cracks, which are caused by the reduced cohesion of the overheated parts which overlie the colder center of an irregularly heated piece.

By observing these precautions a piece of steel may always be heated safely up to even a bright yellow heat when there is much forging to be done on it, and at this heat it will weld well.

The best and most economical of welding fluxes is clean, crude borax, which should be first thoroughly melted and then ground to a fine powder. Borax prepared in this way will not froth on the steel, and one-half of the usual quantity will do the work as well as the whole quantity unmelted.

After the steel is properly heated it should be forged to shape as quickly as possible, and just as the red heat is leaving the parts intended for cutting edges these parts should be refined by rapid light blows, continued until the red disappears.

For the second stage of heating, for hardening, great care should be used; first, to protect the cutting edges and working parts from heating more rapidly than the body of the piece; next, that the whole part to be hardened be heated uniformly through without any part becoming visibly hotter than the other. A uniform heat, as low as will give the required hardness, is the best for hardening.

Bear in mind that, for every variation of heat which is great enough to be seen, there will result a variation in grain, which may be seen by breaking the piece; and for every such variation in temperature there is a very good chance for a crack to be seen. Many a costly tool is ruined by inattention to this point.

The effect of too high heat is to open the grain; to make the steel coarse.

The effect of an irregular heat is to cause irregular grain, irregular strains and cracks.

As soon as the piece is properly heated for hardening it should be promptly and thoroughly quenched in plenty of the cooling medium water, brine or oil, as the case may be.

An abundance of the cooling bath, to do the work quickly and uniformly all over, is very necessary to good and safe work.

To harden a large piece safely, a running stream should be used.

Much uneven hardening is caused by the use of too small baths.

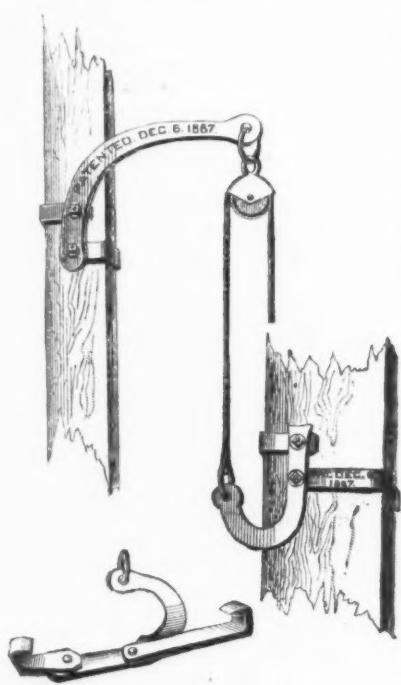
For the third stage of heating, to temper, the first important requisite is again uniformity. The next is time. The more slowly a piece is brought down to its temper, the better and safer is the operation.

When expensive tools, such as taps, rose cutters, &c., are to be made, it is a wise precaution, and one easily taken, to try small pieces of the steel at different temperatures, so as to find out how low a heat will give the necessary hardness. The lowest heat is the best for any steel, the test costs nothing, takes very little time, and very often saves considerable losses.

There are in New York City 11,339 manufacturing establishments, and their product in 1880 was valued at \$472,926,437, about one-eleventh of the total production of the country. These figures have been increased during the last five years. Including Brooklyn, there are 47,587 more people directly engaged in manufactures, or 277,587 in the two cities, producing more than 12 per cent. of the industrial products of the entire country.

Adjustable Lumber Hoist.

Every builder engaged in putting up frame structures will appreciate the advantages of the hoisting attachment illustrated in the accompanying engraving. It is a simple clamp adapted to be attached to any upright post or stud of the frame, and which by means of the curved arm extends outwardly, carrying the block through which the rope runs for hoisting material. A similar clamp is provided for the lower end of the rope, which engages with the stick to be raised in a way to save all

*Adjustable Lumber Hoist.*

trouble in tying knots or wrapping the rope around the timber. The saving of time in the use of this device is its most important feature. The clamp here shown is manufactured by W. S. Welch, Westfield, N. J. With reference to the capacity of this device, the maker informs us that it is adapted to fasten to uprights from 2 x 2 in size to 4 x 6, and that the grip will carry timbers ranging from 2 x 6 to 6 x 12. The small cut shows the position of the device for dropping over the timber ready to hoist up. This will be appreciated by our readers, as already remarked, as a very useful and labor-saving device.

In selecting the names of the new cruisers for the navy, Secretary Whitney has followed the practice of his predecessors, and has chosen those of the larger cities of the country. The Atlanta, Boston, Chicago, Charleston, Baltimore and Newark had already been named, and now it is announced that the two cruisers under contract, heretofore known only as Nos. 4 and 5, are to be named Philadelphia and San Francisco. In naming the new gunboats, however, the Secretary has begun a new series, and the Concord, the Bennington and the Yorktown will commemorate the battles of the revolution. The smaller gunboat is to be called the Petrel, apparently to give the Dolphin a companion.

English newspapers report the introduction into England of J. W. Britton's machine for straightening sheet and plate iron. The machine has been introduced at the works of the Redcliffe Galvanizing Company, Bristol, the Blackwall Galvanizing Company, London; Messrs. Davies Bros. & Co., Limited, Wolverhampton, and Messrs. Hatton, Sons & Co., Bilston.

An Important Patent Suit.

An important bicycle patent suit was begun at Chicago on the 26th ult., before Judges Gresham and Blodgett, sitting together in the United States Circuit Court. The Pope Mfg. Company, of Boston, are the complainants, and the Gormully & Jeffrey Mfg. Company, of Chicago, are the defendants, there being in all five cases to be decided. It appears that the Pope Mfg. Company have for many years been engaged in the manufacture of a high grade of velocipedes, bicycles, and tricycles under various patents which they owned, and which styles and high grade machines they reserved for their own exclusive manufacture. In December, 1884, they made a contract with Mr. Gormully by which he was licensed under royalties to make certain grades and styles of machines, but not to manufacture under the reserved patents, the validity of which he acknowledged. He also agreed that if he manufactured under the reserved patents injunctions might be entered against him without notice as to them. It is claimed in these suits that the defendants in violation of the agreement have been manufacturing under the reserved patents, embodying among other things the adjustable ball-bearings and adjustable flexible saddles, until they have become full-fledged rivals of the Pope Mfg. Company in the production of all grades of velocipedes, bicycles, and tricycles. The first two suits are brought on the contract and the last three are for infringements of the reserved patents.

The Iron Trade of the Pacific Coast.

I. Steuart, of San Francisco, in his annual review of iron for 1887, says:

It is pleasing to record that business is reported by foundries generally to have been more satisfactory throughout the year now closing than for some years past. All are presently full of work with good prospects in the future, while the coast has scored a substantial gain through the enterprise of the proprietors of the Union Iron Works securing Government contracts for the construction of cruisers, thus establishing and developing what will be one of the most important and valuable industries on the coast. The range of spot prices of pig iron has been high during the year, touching \$30 per ton for soft iron, causing foundrymen to draw more liberally on scrap iron than usual. The undernoted figures show the stock, importations and consumption of pig iron in the city during the year now ended:

	Tons.
Stock of pig iron held by foundries and mills in the city December 31, 1886....	9,650
Importations were made from the following sources during 1887:	
Great Britain—soft iron.....	7,850
Great Britain—white iron.....	1,580
Total.....	9,430
Eastern States—soft iron.....	1,275
Oswego Iron Co.—Oregon.....	300
California Iron and Steel Co.—Clipper Gap.....	900
Puget Sound Iron Co.—Port Townsend..	2,505
Total.....	14,410
Grand Total.....	24,060

CONSUMPTION.

	Tons.
Pig iron melted by city foundries and mills.....	13,350
Pig iron reshipped.....	3,125
Total.....	16,475
Total stock of pig iron in the city held by foundries and mills, and excluding pig iron held by the California Iron and Steel Company at their depot, about 600 tons of all grades.....	7,585
The stock of pig iron in the city is held as follows:	
Soft iron held by importers and dealers..	425
White iron held by importers and dealers.....	765
Soft iron held by foundrymen	4,295

White iron held by foundrymen	200
Mills holding	1,900
Total.....	

The chief points of comparison in the years 1886 and 1887 are as follows:

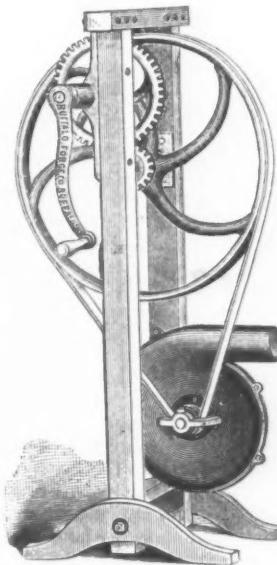
	1887.	1886.
	Tons.	Tons.
Stock of foundry and mill pig iron in consumers' hands.....	6,395	7,853
Stock of foundry iron in importers' and dealers' hands.....	1,190	1,797
Importations from Great Britain.....	9,430	6,867
Importations from Eastern States.....	1,275	2,676
Importations from coast furnaces.....	3,705	2,147
Range of prices during the years 1886 and 1887:		
Per ton.		
Foreign soft iron, 1886	\$23.00 to \$21.00	
Foreign soft iron, 1887	23.00 to 30.00	
Eastern soft iron, 1886	24.50 to 21.50	
Eastern soft iron, 1887	24.50 to 27.00	

COAST FURNACES.

The Puget Sound Iron Company's furnace at Port Townsend has been the only furnace on the coast in blast during the year, and that only for a short time. This company intend putting this furnace in blast again about March or April next. Total importations of scrap iron for the year have been 24,461 tons.

Crank Hand Blower.

We annex a cut of a newly designed hand blower built by the Buffalo Forge Company, of Buffalo, N. Y., which seems to be admirably adapted to certain kinds of work. A novel feature and one of unquestionable utility as well is the ratchet crank by means of which the handle when released by the operator does not continue to revolve with the fly-wheel, making it necessary to keep without its radius, but

*Hand-Blower, Built by the Buffalo Forge Company, Buffalo, N. Y.*

immediately falls to and remains in the position for starting up. This is a point which will be appreciated by all who have ever operated the ordinary crank blower. All gears and working parts are proportioned to attain the greatest service with the least power, and the element of friction in this machine is claimed to be reduced to a minimum.

Some time since, the Council of the Iron and Steel Institute of Great Britain issued a preliminary circular of inquiry to its members, relating to the proposal of holding a meeting in this country this fall. Since then no official communications have been issued, and it is questioned whether the plan will be carried out this year.

National Association of Stove Manufacturers.

The annual meeting of the National Association of Stove Manufacturers was held last week at the Burnet House, Cincinnati. The auxiliary organization, the Stove Founders' National Defense Association, held a meeting on Tuesday afternoon for the transaction of private business, President Henry Cribben in the chair, and Secretary D. M. Thomas filling the duties of his position. On Wednesday morning the regular sessions of the National Association began, with a large representation of the membership.

President J. L. Smyser opened the deliberations of the convention by hastily presenting some of the more important facts connected with the history of the organization, and suggested the necessity of new methods for bringing under the influence of the association those in the trade at present outside of its membership. He dwelt upon the work of the local associations, the progress which had been made by them during the past year, and the confidence of expression which their frequent and informal meetings had created in the minds of the timid and less informed. He reviewed the results of convention discussion of trade topics, and urged upon the membership the necessity of liberal expressions of opinion regarding the vital questions of the day. "Certain it is," he said, "the future of the business demands of us all a more persistent inquiry into the causes which, by annoying gradations, are eating away the life of the business." He urged upon the members the desirability of maintaining local associations. "Necessity," said he, "is fast pressing the busy business world into the adoption of means looking to class protection," and he inquired if it was not the part of wisdom to inaugurate methods calculated to avert the suicidal results of unorganized competition? Continuing, he said:

Is there a man in this hall who has the temerity to maintain that overproduction and the consequent wild rush for its distribution, are not fast bearing down upon the business, and gradually abridging its profits? Is there one who does not recognize in all this the operation of the identical causes which have attended the decline of other industries? Is there one to say that a continuation of the processes of the past, unrestrained by some type of organized relief, can do other than eventuate in ultimate adversity to the majority of stove manufacturers? The operating causes being the same, the necessary results being undenied and undeniable, is it a compliment to our intelligence that we further disregard the warnings of history and the convincing deductions of commercial law and logic? Why should we hesitate to do now that which all agree must be done at no greatly remote period? Why dally with their evitable?

The work can be more easily and permanently done now than after half of us are broke. To refuse is on a parallel with the man who only one mile above Niagara declines to strike shoreward because the surface about him is yet undisturbed by breakers. I am no alarmist. It is not my purpose to frighten your bankers or give disquietude to your wives with reference to their spring bonnets. But it is my purpose as it is my duty to give emphatic utterance to the convictions which reason, history and common sense impel. The consummation of what all seem to want, but which many declare to be a stupendous undertaking and almost impossible, is in reality a plain and simple thing. The teachings of last year's experience in the conduct of the various local associations adduced two prerequisites for permanency and common good. They are—

1. Willingness to co-operate.

2. Good faith.

This opens up a field for discussion and deliberation too broad for me to enter now. I could speak on this question for the balance of the week and not exhaust it. If I have already outmeasured your patience I know I have not its importance. The general province of an executive is to outline principles rather than to discuss their operation and practical application. For these we shall rely upon our general secretary and the Committee on Co-operative Distribution. As this subject comprehends all the various subsidiary questions peculiar to trade I trust both secretary and committee will treat it with all the gravity and fullness it demands. All other questions are wrapped within its folds. The distribution of stoves is a purely local question. Albany and Louisville would be wasting time to confer on the matter of local distribution. The formation of local associations should be carefully bounded by the lines of competition. Geography should have nothing whatever to do with them! Once succeed in having these organizations take form, including within their membership a strong majority of those operating in prescribed competitive districts, and you at once relegate the labors heretofore necessary upon this floor to their more legitimate spheres of "local" treatment. Your association should and would continue to meet. But its work would be limited to the examination of fundamental general principles and congratulatory conference. I now ask your patience while directing attention to another phase, or branch of the subject of co-operation. As heretofore discussed it bore reference to the relations necessary to the evolution of the best results in districts or communities. I now propose to discuss these same relations as applicable to the craft as a whole, and which, if consummated, would be more properly called "consolidation." Co-operation is one thing—consolidation is another thing! And yet they are subjects so intimately interlocked and interwoven as to constitute an absolute and close kinship. So much so that we may venture the paradox, that being the same they are different! Be all this as it may, the terms are interchangeable as occasion may arise for their employment in a running discussion such as I propose. The terms "pool" or "trust" belong to the same family, and are synonyms of the former two. These may also be used without prejudice to the substantiality or dignity of the subject.

Co-operation can and will abridge many of the false practices of the trade, and its fostering care be turned to profitable account. The province of local associations is that of distribution. They can never reach the question of production. This can alone be done through the agency of absolute consolidation. Then the logical formula is expressed in this:

1. Overproduction is destroying the business.

2. Overproduction can only be abridged through the agency of consolidation.

3. Consolidation then becomes a necessity.

All, I believe, will accept the premises as correct, while many will reject the conclusion, because of an absence of practical demonstration. Demonstrations, amply convincing, are to be found at every turn we take; but faith is desired, because the manufacture and sale of stoves are not factors of their operations. A practical illustration can not be adduced short of an actual experiment. The only thing left us is to apply to the subject the principles of reason, coupled with observations and the experience furnished by other industries having some parallel to our own. In reality the latter should not be required. The mind tires in the vain search for relief outside of absolute "consolidation." Competition can only be limited by concentrating the management. You can only limit

the management by massing your interests. Our hesitation to grapple practically with this issue comes more of adhesiveness to change than want of conviction. To overcome this it becomes necessary to demonstrate as clearly as possible that the advantages accruing will justify the effort. In this investigation two factors only need be considered:

1. Will greater profits accrue to the business?

2. Will it insure to comfort and give perpetuity?

At Detroit I essayed to discuss this question of savings in an informal and rambling way, with resultant figures, mostly obtained from the floor, that are at once convincing and surprising. Now, let us review them, apply such corrections as experience and later thought may have suggested. The items considered were as follows:

Patterns,	Advertising,
Traveling salesmen,	Branch houses,
Bad debts,	Freights,

It is necessary we fix some primary facts as a basis of calculation and to which to apply such results as may be reached. At Detroit it was assumed that the annual sales of stoves for the United States were \$30,000,000. Subsequent revision indicates a higher figure, and the sales of 1887 are now confidently placed at \$33,000,000. There are in this country about 315 legitimate stove manufacturers. Taking the item of patterns, we meet a ravenous moth that day and night is gnawing away at the vitals of the business. From the best data I can obtain, the average annual cost of patterns to each of these will exceed \$5000. Electing the conservative side of the question, I prefer to reduce this to \$4500, which yields us an aggregate of \$1,317,500 spent yearly for the simple item of patterns. Under the operations of conjoined effort, am I not safe in saying this expenditure can or should be reduced to \$317,500, leaving to the consolidation a net saving of \$1,000,000.

Next comes advertising. It was conceded by all present that \$300,000 was a conservative limit for retrenchment in this item. To escape any danger of the charge of overestimating, let us fix the item of savings at \$250,000. Traveling salesmen. This mention will go straight to every mind and enlist seriousness. The growing demand for fired work, born of competition, superinduced by overproduction, is taking on increased proportions almost staggering in results. It is estimated that no less than 1000 men are employed to help unload our lofts. A very low average of expense for these is \$2500 each yearly, giving the enormous aggregate of \$2,500,000. Wipe away the competition and direct your business under one general management, and this item can safely be placed at not over \$1,000,000. From this one direction we would find to credit of profit and loss \$1,500,000. The abolition of branch houses will afford an additional credit of \$250,000. Bad debts, while placed at \$100,000, will quadruple this, while by a correction of the serious freight question a contribution of not less than \$200,000 would ensue.

As this is intended as illustrative, and given with the view of inducing thought and discussion, rather than an attempt to approach practical results, I shall leave with you these six items only, leaving it with you to supply for your own satisfaction and enlightenment the multiplied sources of retrenchment I omit. These alone will dazzle you—affording, as you will readily perceive, a total and actual saving of \$3,300,000. Assuming sales to be \$33,000,000 if you please, you have at once an unquestionable dividend of 10% upon aggregate sales. Now, mind you, an earning of 10%, the output of all sales having been made at former actual cost. For

instance, the foundryman whose last year's sales amounted to \$100,000 and closed without any return, would, under this suggested operation, discover \$10,000 to his credit.

It is useless for me to indulge in an extended elaboration of this business proposition. I refrain from indicating the innumerable indirect benefits necessarily consequent upon such a combination. All the multiplied dependencies and concomitants peculiar to this industry would receive quick and satisfactory solution. Credits, freights, repairs, labor, with all their associated evils, would be subordinated to intelligent and equitable direction. Your Defense Association would no longer be required for the protection of your rights or maintenance of dignity. The mechanic would thus be served by emancipation from objectless and unwise efforts, and undisturbed conduct of your business be assured. To avoid misapprehension and forestall criticism, it is proper I suggest that in this all idea of a monopoly is distinctly disavowed. Under its operations and by virtue of saving prices of stoves could be and should be reduced. Labor should receive its proper recognition and merited compensation. Collateral to what is presented here it becomes us to study the causes and mark the tendency so apparent on the part of other industries to move in the direction of the protection of their interests by the adoption of some type of consolidation. Included in this category we and the cotton-seed and oil interests, natural oil, sheet iron, bolts, screws, rubber goods, cement, sewer-pipe, white lead and so on through a long list of which you have knowledge. All this means something. Intelligent business men do not act except for reasons grounded in good judgment and wisdom. The same causes which call for repressive and protective measures with other industries exist in ours.

I am induced to believe that many of our craft appreciate the importance and necessity of some action, as suggested; but, in the absence of some formulated plan, hesitate to urge the movement. To devise a method wholly acceptable to all seems indeed the greatest difficulty to be overcome. This will require mature thought and patient investigation. That it can be eventually compassed none can doubt. The little thought I have given the subject finds me barren of a method satisfactory to myself or in any sense equal to the diversified interests which would require adjustment. With the single view of inducing discussion and thought, I introduce a few hints, relying upon time and an intelligent examination by you for their development. One or more consolidations might exist—I should prefer one. For want of time I shall not attempt to analyze the processes required, but in a most general and crude way give an outline.

The company should have its officers and managing board, with absolute control vested in them by law. Each member should have his property taken by the company represented in shares and bonds. An eminently fair and capable board of assessments should have the power to fix and certify the value of all property turned into the consolidation. For real estate, patterns, stocks on hand and good will the consolidation should issue its stock at par. The value of the "good will" should be determined by results obtained from the books of the owner, running through three years last past. Bonds for the value of the real estate should, in addition to its stock representation, be issued as against the property, and delivered to the members without any charge. These bonds should be made to run from one to ten years—one-tenth of the bonds to be retired yearly from the profits of the consolidation bonds

bearing 5 per cent. interest, payable semi-annually. Five per cent. cash of the face value of the stock should be paid into the consolidation as capital for incidental purposes. Omitting the details we have the general controlling principles, and are ready for business. Each member would continue to conduct his manufacture and sale as heretofore, subject to the direction of the mother head as to terms and prices. No leading stove would lose its identity or the former owner his position if he merited it. Dividends would be made annually, and in my judgment they would be larger than you have been accustomed to in the past. As to the stock and bonds I will illustrate. The property of A is valued as follows:

Real estate.....	\$30,000
Patterns, flasks, &c.....	15,000
Stock on hand.....	40,000
Good will.....	15,000

I would receive stock at face value for..... \$100,000 And bonds amounting to \$30,000—having turned over to the consolidation the \$100,000, of which the four items constitute, but nothing more. It may be asked, Why this issue of bonds in excess of property value? The former owner holding bonds against his own property would induce watchfulness and care of both property and business. Holding a security of a tangible value would afford facilities in the settlement of old affairs, in many cases desirable. In the next place, such dividend in advance would in many cases insure action favorable to the undertaking from parties who might otherwise hesitate. There would not be the slightest difficulty in paying the interest on the bonds and dividends on the stock.

Tests of Krupp Shafting Steel.

The following tests were made by Lieut. B. H. Buckingham, U. S. N., inspector on August 9th and 10th of the steel of the propeller shafting for Cruiser No. 2, made by Friedrich Krupp, of Essen, Germany :

Tensile Tests for Steel for Cruiser No. 2.

Position of specimen on shafting.	Elastic limit. Pounds per square inch of original section.	Ultimate strength. Pounds per square inch of original section.	Elongation after fracture. Per cent.
Crank shaft....	33,953	65,644	27
" "	33,953	65,644	28
" "	31,691	63,383	32.5
" "	31,691	63,383	28
" "	31,691	61,121	32
" "	29,430	63,383	28
" "	31,691	61,121	32
" "	31,691	61,121	32
Thrust shaft end	33,953	65,644	28
" "	31,691	65,644	27
" "	31,691	65,644	27
" "	31,691	65,644	30
" "	31,691	70,168	25
" "	31,691	74,705	24
Screw shaft....	29,430	61,121	28
" "	27,168	58,860	29
" "	31,691	65,644	29
" "	29,430	63,383	29
Thrust shaft....	33,953	70,168	27
" "	33,953	70,168	27

Diameter of specimen 12.65 mm. = 0.498 inches. Length of specimen between measuring points 100 mm.

The chemical analysis of the steel made in this country showed the carbon to be 0.30; sulphur, 0.042; manganese, 0.57; silicon, 0.18, and phosphorus, 0.088 per cent.

The Mullins Silicated Iron and Steel Company, of East St. Louis, still claim exclusive right to the Wittman steel patent, and bring forward articles of agreement showing that the patents had been assigned to them by the Pittsburgh Steel Casting

Company, on December 5 last. The secretary displays the assignment itself, which stipulates a consideration of \$5000, and further that the Pittsburgh company shall have the right to a free use of the patent, by their then existing company or by any other organization then in contemplation of formation by them, to the extent of an output of 250 tons per day. The Pittsburgh company then transfers to the Mullins company all interest in the patent, and all right which the Pittsburgh company had in any additional improvements upon the invention or any reissue, and, generally, all rights secured to the Pittsburgh company by the original assignment to them from Noel B. Wittman, the patentee.

The Wootten Engines on the Philadelphia and Reading Railroad.

A short time ago we published an item, which has since been widely circulated, to the effect that it had been finally decided by the management of the Philadelphia and Reading Railroad to abandon the Wootten dirt-burning engines, that the latter had been the most expensive feature of the road's equipment, and that standard boilers would be substituted at the earliest opportunity. Our statements were made on what we considered good authority. The Wharton Railroad Switch Company, of Philadelphia, Pa., who control the Wootten patents, however, write to us under date of February 3 as follows:

"The Philadelphia and Reading Railroad Company have not found the Wootten engines the most expensive features of their equipment, whose performances have been commented on. They have not substituted any other boiler, and have not changed any of their engines. They have recently contracted for a large number of Wootten engines, which are now being built by the Baldwin Locomotive Company, and are being delivered at the rate of two per week."

The rates on plain wire from Chicago to Ottumwa, Iowa, via the Chicago, Milwaukee and St. Paul, have been reduced from 15 cents to 14 cents, taking effect February 5; on the same date the rates on bar iron, sheet, galvanized, &c., in that class will be advanced from 15 cents to 16 cents per 100 pounds to the same destination. Window glass also suffers a 1 cent advance. The rates on snow plows from Chicago to St. Paul and Minnesota Transfer were fixed arbitrarily on the 23d ult. at \$48 each, allowing a man to go in charge of each plow.

The secretary of the Namaqua United Copper Company, Limited, has issued a circular to the effect that a contract has been concluded with the representatives of the French syndicate for the purchase of the company's ores for a period of three years.

The Southern Railway and Steamship Association have issued a new freight classification for the use of all lines between Eastern and Western points and Southern points. It went into effect on February 1.

Julian Kennedy, general superintendent of the Lucy Furnaces, at Pittsburgh, and the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa., has resigned his position.

Horace G. Cleveland, of the firm of Cleveland, Brown & Co., one of the most widely known iron manufacturers in the West, died at his home, in Cleveland, Ohio, on the 2d inst., of typhoid fever.

MANUFACTURING.

Iron and Steel.

About two weeks ago the Pittsburgh Tube Company and the Continental Tube Works, Limited, at Pittsburgh, notified their employees of a 10 per cent. reduction in wages, to take effect on the 1st inst. The employees refused to accept the proposed reduction, and both establishments closed down. At a conference held on the 3d inst. between the proprietors and workmen, the demand for a reduction was withdrawn and operations at both works were resumed. The Pennsylvania Tube Works, also in the above city, have not requested a reduction in wages and the works are running full in all departments.

The Solar Iron Works, of William Clark's Son & Co., at Pittsburgh, which have been idle for two months on account of repairs and also on account of the refusal of the proprietors to accede to the demands of the Amalgamated Association to discharge a roller who had charge of two sets of rolls, resumed operations on the morning of the 3d inst. with non-union men. One of the proprietors states that in the future no man will be given employment who is a member of the above-named organization.

The Jefferson Iron Works, at Steubenville, Ohio, resumed operations in all departments on the 30th ult., with the exception of the nail factory, which is running about half time.

Belmont Furnace, of the Belmont Nail Company, at Wheeling, W. Va., has been closed down until a reduction in the price of ores and coke takes place. C. P. Perin, manager of the furnace, has resigned his position. His successor has not yet been named.

The Riverside Iron Works, at Wheeling, W. Va., have signed the steel scale, and operations have been resumed in the steel department. The nail works of the above concern are still idle, with no immediate prospect of resumption.

Two of the Bird Coleman furnaces, at Cornwall, Lebanon County, and one at Chestnut Hill, near Columbia, Pa., blew out January 26, on account of the scarcity of coal and to make repairs.

A short time since we noted the fact that the Warren Tube Company, of Warren, Ohio, were in financial troubles. Since that time the works have been closed down and suits aggregating \$47,007.82 have been commenced against them in the Common Pleas Court as follows: Phoenix Iron Works, Meadville, \$2065; Mahoning Iron Company, \$2404.26; Western Reserve National Bank, \$10,000; First National, two suits, \$7800; Second National, \$5000; P. L. Kimberly & Co., Sharon, \$12,663.04; S. Jarvis Adams & Co., Pittsburgh, \$2073.87; First National Bank, Salem, \$5001.65. The majority of the suits are brought on notes given by the tube company, and to which individual indorsers are made party.

A meeting of the holders of judgment liens on the property of the Columbus Steel Company, at Columbus, Ohio, which was recently levied on by the sheriff, was held recently, when it was decided that the best plan to be pursued would be to put the works in the hands of a receiver. A petition asking for the appointment of a receiver was accordingly filed in the courts, and Colonel Charles Parrot has been appointed to take charge of the affairs of the concern. It is thought the works will resume operations in a short time.

A Pittsburgh manufacturer, on being interviewed as to the cause of the present depression in the wrought-iron tube industry, made the following statement: "The whole trouble is overproduction.

Every mill yard is piled with pipe, and no market. There are too many mills in the country. During the past 18 months production has increased over 100 per cent., and amounts to over \$20,000,000. There was money in the manufacture and everybody rushed in. During the period I mention a new mill was started at Boston, one at Oil City, at Wheeling, at Warren, Ohio, and two mills in Pittsburgh. Besides this, all the old mills increased their capacity enormously. And there is not market enough to take up both new and old. I do not think a reduction in wages will benefit the manufacturers any, as in proportion as wages come down so will the price of pipe."

The 10 per cent. reduction in wages at the Cambria Iron Company's works at Johnstown, Pa., went into effect on the 1st inst.

Dunbar furnace, of the Dunbar Furnace Company, at Dunbar, Pa., which closed down several weeks ago because the men refused to accept a reduction of 10 per cent. in wages, has started up again, the men agreeing to accept the reduction.

No. 4 Furnace, of the Bethlehem Iron Company, at Bethlehem, Pa., was blown out on the 28th ult., for the purpose of being relined and repaired. As soon as repairs are completed it will resume operations.

J. A. Adair, superintendent of the Bessemer department of the Homestead Steel Works, at Homestead, Pa., has resigned to accept the position of superintendent of the Edge Moor Iron Company's Works, at Edge Moor, Del.

At the annual meeting of the stockholders of the Bellaire Nail Works, of Bellaire, Ohio, held on the 28th ult., the old officers and directors were re-elected and a dividend of 5 per cent. declared. The above firm have signed the steel scale, and operations in the steel department were resumed on the 1st inst. The nail factory, which has been idle for some weeks, also resumed operations on the 6th inst., with good prospects for a steady run.

The company who are to erect a large iron vehicle-wheel factory in Pittsburgh have almost completed the plans for the various kinds of carriage-wheels. A. C. Hall, of Colorado, who is the head of the company, states that they have not as yet decided upon a site, but the company are making active preparations to establish a plant as rapidly as possible.

The work of boring out the cast-steel gun has been commenced at the works of the Pittsburgh Steel Casting Company, at Pittsburgh. About a week will be necessary for the completion, as it has to be bored out twice. It will then be sent to the navy-yard at Washington, where the Government will rifle it before it is sent to Annapolis for the final test. Altogether it will take over a month before the gun is ready for this test.

The Belleville Steel and Iron Nail Works, at Belleville, Ill., were sold at auction week before last by Special Master August Barthel, on a foreclosure, to Bernard Hartmann, Henry Reis and James M. Hay, for \$21,590.72. The works are those leased by the Crescent Steel Nail Works and now operated by them, and the sale was on account of a mortgage given the Belleville Savings Bank, which was bought in by the above parties, who were sureties on the note and stockholders of the company.

The stockholders of the Bryden Forged Horseshoe Works, Limited, of Catasauqua, Pa., met in the office of the Catasauqua Mfg. Company, on Thursday, the 26th ult., and perfected a change of title and organization, determined upon at a stockholders' meeting held a year ago. The officers of the old limited partnership were

elected to serve as the officers of the new company, organized under the general manufacturing laws of the Commonwealth of Pennsylvania, and are as follows: Chas. K. Barns, Philadelphia, president; Oliver Williams, Catasauqua, secretary and treasurer; William P. Hopkins, Catasauqua; F. Aug. Schermerhorn and David Lydig, of New York, directors. The company have been in business in Catasauqua for over five years.

S. R. Smythe, secretary of the Swindell Construction Company, Lewis Block, Pittsburgh, informs us that they have closed a contract with H. Disston & Sons, of Philadelphia, for a number of Siemens crucible steel melting furnaces, which will increase the steel producing department of that firm about 60 per cent., and also with Stanley G. Flagg & Co., of Philadelphia, for one of their improved malleable-iron annealing furnaces, 13 feet deep by 8 feet wide, also with Curtis & Co., of Cohoes, N. Y., for a large tagging and socket furnace, in which manufactured gas will be used as fuel, and with the Pennsylvania Construction Company, at Uniontown, Pa., one welding furnace for structural iron-work.

The Ashland furnaces, at Ashland, Baltimore County, Md., which are operated under lease by the Pennsylvania Steel Company, of Steelton, Pa., have been blown out on account of the large stock of iron on hand and the present depression in the steel trade.

Chas. L. Taylor has been made general manager of the works of the Hartman Steel Company, Limited, at Beaver Falls, Pa., the appointment dating from the 1st inst.

The plant of the Bay State Iron Company, in South Boston, was sold at auction 2d inst. The property included 19½ acres of land, together with puddle, rail and steel mills, machine shop and other buildings, and all the machinery and tools. The property was purchased by Charles J. Whitmore for John H. Reed, William S. Dexter and John Cummings for \$210,000 cash. The price is considered very low.

The difference between the Troy Steel and Iron Company and their 2500 employees has been adjusted. The final terms submitted by the company were as follows: The company requires that the men shall return to work at a 10 per cent. reduction, and continue to work until the 1st of May next at such reduction in case the price of rails does not increase. In case the price of rails advances above \$34 per ton at any time before or after the 1st of May, the wages of the men shall be increased proportionately. The wages of the men shall not be reduced below said 10 per cent. reduction during the existence of this agreement. The men shall agree to continue at work until May 1 at such reduction, even if the price of rails does not advance. In case the men quit work after May 1 they shall give the company 30 days' notice. In case the company discharge the men in a body the company shall give 30 days' notice. The men have accepted these terms.

Machinery.

The Flohr Engine Company, of Buffalo, N. Y., have been incorporated to manufacture engines and machinery. Capital stock, \$100,000. The trustees for the first year are Otto Flohr, Franklin S. Buell, Augustus Dowdell, Albert V. Tillman, Franklin J. Anderson, Willard S. Buell, Charles A. Slater, Edwin H. Farrington and Byron J. Tillman.

A number of important improvements and additions will be made to the shops of the Pittsburgh, Cincinnati and St. Louis Railway Company, situated at Columbus, Ohio, in the spring. A foundry completely equipped will be built at a cost of \$36,000. In addition to this a pattern, storeroom, cleaning and grinding depart-

ments will be erected, the former at a cost of \$5400 and the latter at a cost of \$2000. A 120-foot extension to the blacksmith shop will be made, at an estimated cost of \$9000. A dry-kiln to cost \$7000 will also be built. Tools to the value of \$30,000 will be added to the equipments of the different departments.

The Aetna Machine Company, of Warren, Ohio, have just closed a contract with a Chicago firm that manufacture gas well drilling machines to furnish them with all the engines they will use on these machines. The contract is quite a large one.

The Hill Clutch Works, at Cleveland, Ohio, have established a branch office at 28 South Canal street, Chicago.

A dispatch from Canton, Ohio, under date of the 3d inst., reads as follows: "Canton is to have another important industry. At a meeting held in this city today, at which J. S. McLeod, Carl Bartells and a number of other Boston capitalists were present, it was decided to locate the works of the McLeod Pneumatic Railway Company in this city, and they will be removed from Boston here immediately. The company employ about 300 men in the manufacture of a patent railway signal."

A destructive fire broke out on the morning of the 26th ult. at the works of the Oil Well Supply Company, Limited, in Oil City, Pa., by which the business offices and finishing department were completely destroyed. A large quantity of valuable machinery was ruined. In the office the loss was also heavy, a large amount of goods, with books and papers, being destroyed. The loss will aggregate \$40,000. There is an insurance on the entire works and contents of \$125,000. Spontaneous combustion is supposed to have started the fire.

James McNeil & Bro., manufacturers of boilers, engines and general machine work, at Pittsburgh, have recently made some extensive improvements to their works. They have just placed in operation one of Messrs. Bement, Miles & Co.'s, of Philadelphia, largest riveting machines, which is the largest size made in this country, and larger by 24 inches than any in Western Pennsylvania. This machine is capable of riveting by hydraulic power boiler shells and flues made from plates any width up to 96 inches. In conjunction with this machine they have also erected a hydraulic crane or hoist of their own design, by which they are enabled to handle work of any size up to 8 tons weight, which may be carried the length of the shop, or handled at will over the riveting machine. The Messrs. McNeil are also building a large and powerful flanging machine, also worked by hydraulic power, which, when all completed, will be capable of flanging flue holes, boiler heads, stand-pipe rings and a large variety of irregular shapes and which may also be adapted to any kind of hydraulic forging or stamping up to the limits of its capacity, which for boiler heads will be about 6 feet diameter. They are also erecting what will be one of the largest, if not the largest, heating furnace in Pittsburgh. This furnace will have a capacity sufficient to take in a plate 10 x 15 feet. The hydraulic power to operate the machines and hoists is furnished by a large Worthington pump and accumulator. The works of the above firm are at present running to their fullest capacity, being engaged in the manufacture of 24 boilers for the Homestead Steel Works, at Homestead, Pa., 13 boilers for Carnegie Bros. & Co., also a large number of smaller orders for boilers, incline trucks and their annealing box, patented by them in 1884, and which is now in use all over the country, they having recently shipped a large number to Alabama.

Curtis & Curtis, successors to Forbes & Curtis, of Bridgeport, Conn., manufactur-

ers of the Forbes patent die-stock, pipe-threading and cutting-off machines, &c., report business very good with them. While running all the men that their works will accommodate, they are still behind their orders for pipe machines. They have just filled orders for large pipe machines for the Pennsylvania Railroad Company, the Central Forge Company, of Whitestone, N. Y.; the Cumberland Mills, of Cumberland, Me., and others. During January their shipments were nearly double what they were in January, 1887.

The Lockwood Mfg. Company, East Boston, Mass., are building two large steam dredges to be used on the Cape Cod Canal.

E. P. Bullard, 72 Warren street and 62 College Place, New York, has issued a list of iron and brass working machinery, new and second hand, for which he offers special inducements to immediate purchasers. Mr. Bullard, we understand, desires to make room for another branch of business—cold-rolled shafting, pulleys and hangers.

Machine tools built by Messrs. C. L. Jackson & Co., 14 W. German street, Baltimore, Md., are illustrated and described in a very comprehensive manner in a new catalogue which has just been issued by them. The tools are of a wide variety, such as engine and hand lathes, shaping machines, drill presses, screw machines, gear cutters, pipe cutting and threading machines, bolt cutters, milling machines and others. Messrs. Jackson & Co. announce also that they are prepared to furnish plans, specifications and estimates of cost for fitting out all kinds of shops using iron and wood working machinery.

A very attractive catalogue, dated 1888, has just come to hand from the Silsby Mfg. Company, of Seneca Falls, N. Y., giving illustrations and descriptions of their fire engines, hose carriages, steam-heating apparatus and fire department supplies generally. The engravings are finely executed, the descriptions more complete than usual in trade publications, and the whole of unquestionable interest and value.

J. W. Dennis, 14 West Seneca street, Buffalo, N. Y., has issued a new catalogue illustrating and describing his specialties. Among these we note universal center grinders and attachments, milling cutter grinders, the Shoemaker single cord belt-shifter, the Ellingwood drill chuck and a number of other devices.

The Hall Steam Pump Company, 91 Liberty street, New York, have just issued a very attractive catalogue, showing engravings of their different styles of pumps.

The Wainwright Mfg. Company, of Boston, report the following shipments of their corrugated tube feed-water heaters during the month of January: Two in Boston and Philadelphia; three in Westfield, Mass.; and one each in Lawrence, South Framingham, Finchendom, Kingston and Rockland, Mass.; Birmingham, Conn.; Rutland, Vt.; New York City; Cleveland, Ohio; Bessemer, Ala.; Halifax, Nova Scotia, and Japan.

There was recently cast at the Weimer Machine Works Company, Lebanon, Pa., a 26,000-pound bed-plate and a 22,000-pound steam cylinder for the large blowing engine for the Warwick Iron Company, of Pottstown, Pa. The engine has a 108-inch blowing cylinder, 54-inch steam cylinder, with 72-inch stroke. The engine will weigh 160 tons when erected. They are also building for the Oregon Iron and Steel Company, of Portland, Oregon, a 42 x 84 x 48 inch stroke blowing engine, three cinder cars and 20 filling barrows. They have received the following orders for their rotating cinder cars for removing hot cinder: Four for the De Bardeleben Coal and Iron Company, of

Bessemer, Ala.; also 50 charging barrows from the same firm; two cinder cars for McCormick & Co., Harrisburg, Pa.; five for the Tennessee Coal and Iron Company, Pratt Mines, Ala.; three for the Sheffield and Alabama Coal and Iron Company, Sheffield, Ala.; and four for Robert H. Coleman, Lebanon, Pa. The works have recently shipped engines to the Iron Cliffs Company, Negaunee, Mich.; the Northwestern Iron Company, Mayville, Wis.; the Gadsden, Ala., Furnace Company; the Lebanon Furnaces, Lebanon, Pa.; and a double-cylinder power blower to the Virginia Nail and Iron Works Company, Lynchburg, Va.

Hardware.

The American Wire Goods Company, New Haven, Conn., announce that having purchased the entire plant and business of the Perkins & Bradley Mfg. Company, and secured control of their patents, they are now prepared with new and improved machinery and increased facilities to fill orders for Star wire coat and hat hooks, and drive hooks, wire garment hangers, twine baskets, towel rolls, &c.

The Southern Wire Company, St. Louis, Mo., have sold their barbed wire machinery, wire nail machinery, fixtures and merchandise to the St. Louis Wire Mill Company, who will continue the manufacture of all varieties of plain wire, barbed wire, wire nails, staples, &c. They state that they will manufacture the genuine Glidden two-point barb and also the Lyman four-point barb.

Owing to the large demand for their Stuart screen frames, E. C. Stearns & Co., Syracuse, N. Y., have been obliged to procure a separate building for the manufacture of these goods alone. This factory, which has a frontage of 200 feet by 44 feet depth, is situated on the bank of the Erie Canal, affording them much cheaper facilities, both for receiving and shipping the goods.

The New England Specialty Company, North Easton, Mass., have recently put in an engine lathe and shaping machine. They refer to their business in 1887 as the largest in several years, 1888 starting in with equally good prospects.

Miscellaneous.

Under date of the 1st inst. the Beymer-Bauman Lead Company, of Pittsburgh, announce to the trade that they have returned to the offices occupied by them prior to the fire of last August in the third story, front, of the new Hamilton Building, Room 302, No. 91 Fifth avenue, Pittsburgh, Pa.

The Martin's Ferry Construction Company, organized under the laws of West Virginia, are a new corporation formed at Wheeling, W. Va., for the purpose of mining for clay, coal and petroleum, and transporting the same, manufacturing pottery, electrical apparatus, &c., and constructing houses and manufacturing plants of every kind and character.

Ritter & Conley, boiler and tank manufacturers, of Pittsburgh, have been awarded the contract of constructing the new water works, for Galveston, Texas. There were 12 bidders in all, including firms from Chicago, Cleveland, St. Louis, Indianapolis and Eastern cities. The work includes a steel stand-pipe 25 feet in diameter and 160 feet in height, with a capacity of 558,000 gallons of water. Two steel tanks, each 100 feet in diameter and 20 feet high, with a capacity of 1,176,000 gallons each, are also to be constructed. These will be the largest tanks that have ever been constructed in the United States.

The foundry department of the Huntingdon Mfg. Company, in Pennsylvania, was destroyed by fire 3d inst., but will be immediately rebuilt. The loss was \$30,000.

THE WEEK.

An important decision was rendered at Chicago by Judge Gresham in the Central Iowa Railroad foreclose case. A year or two ago a firm of extensive grain shippers made a contract in Iowa with the Central Iowa Railroad for certain rebates on their shipments. The Judge refused to allow these to be paid, on the ground that the statutes of Illinois prohibit discrimination by railroads in this or any other way. Though the contract was made in Iowa, it was to be enforced in Illinois, and was illegal under the law no matter where made.

It is alleged that foreign capitalists, notably the California Redwood Company, organized in Edinburgh, Scotland, are, by covert and unfair means, obtaining possession of vast tracts of valuable land in the United States for no more than a nominal consideration. In the case mentioned the redwood forests of California were examined by an expert, who reported that the section explored, comprising something like 64,000 acres, was worth \$22,000,000, as the tract, taken as a whole, would average 200,000 feet to the acre of good redwood lumber. As *bona fide* settlers are each entitled to 160 acres, it is alleged that 400 men were obtained at \$50 per head who registered their claims and promptly conveyed the land thus described to the manager of the Scotch syndicate, the aggregate forming a tract of territory twice the extent of Ireland.

The first Florida strawberries this season were received in New York about the same day that the thermometer in the Northwest ranged anywhere between zero and 40° below.

In a paper on "British Investments in American Railways," read by Mr. Thomas Skinner at the Institute of Bankers in London last month, he noted the fact that in 1867 the issues of only 10 American roads were quoted in the London official list, with a nominal capital of £78,000,000, whereas now the issues of 82 companies are so quoted, with a nominal capital of nearly £450,000,000. Of the present amount £46,000,000 is represented by sterling bonds, which are almost exclusively held by British investors, who, despite a few partial defaults, have obtained an average return on their money of over five per cent. The sterling bonds are, however, much less important than the currency or dollar bonds, which amount to about \$175,000,000. In these bonds, which are probably held much more largely in the United States than in England, the defaults have been more numerous. The London *Economist* roughly estimates the British holdings of American railway shares at \$500,000,000, and of bonds about \$750,000,000. It thinks that British investors have learned the "vital differences" between our shares and the "English railway ordinary stocks," and will in future take "round dollar bonds" in preference.

An English syndicate has added to its purchases of land in Coahuila, Mexico, until it has obtained title to 2,500,000 acres—equal to about one-fourth of the entire State. Much of the land is mountainous.

Frequent complaints come from Costa Rica and the neighboring Central American States that merchandise received there from the United States is badly packed. The chief engineer of the Costa Rica Railroad, while in New Orleans, spoke of this failing as being highly detrimental to American trade. Minister Logan, of Guatemala, has made a special report to the same effect, and perhaps no point is more insisted on than the necessity of better packing for goods destined to countries where the chief transportation is by

mule back over precipitous mountains. The bulk of the population live on the Pacific Coast or the tablelands in the interior.

President James C. Spencer of the Aqueduct Commissioners reports that 600 feet have been excavated under the Harlem River, and that there is very little salt water leakage, although much below low water mark. He states that the tunnel will be completed this year to 135th street, but the construction of the pipe line thence to Central Park Reservoir, and the construction of the Muscoot dams and reservoirs will require another year for their completion, which, when effected, will supply the increase of water now required.

Mayor Hewitt, in a special message, makes suggestions for a comprehensive scheme of rapid transit from the City Hall to outlying districts near the boundary, which may prove to be of inestimable value to wage-earners in their efforts to obtain a suitable habitation. The New York Central Railroad Company would probably assume the responsibility for construction and subsequent management for a term of years if the scheme is sanctioned by the Legislature, but President Depew would not favor so short a period as 35 years, as proposed, and then relinquish all right and title. Neither will the company take the initiative in pushing this scheme to a realization.

The chief engineer of the Montreal Harbor Commissioners has submitted for approval a scheme for the enlargement of the wharfage capacity of that city, comprising a slack-water basin in which vessels can be safely moored, so arranged as to provide for the erection of warehouses accessible by lines of railway. The area of the dock will be 72 acres, and the wharfage capacity will be doubled.

The East River tunnel scheme, advocated by the New York and Long Island Railroad Company, is being seriously discussed before a committee of the New York Common Council. The franchise asked for includes the right to connect with the Grand Central Depot and with the proposed tunnel under the Hudson River at Christopher street. The president of the railroad company, in his argument, urged the advantages which would be secured by the direct transportation of freight; also of the rock foundation which permits the building of underground warehouses, thus diminishing the cost of depot and storage room. The top of the tunnel is to be 60 feet below the surface, and elevator shafts are to be sunk at the intersection of the lines of elevated railways.

A single day of fog in London costs from \$35,000 to \$40,000 for extra gas. It must be a benighted city.

The coldest place in the West is said to be the town of Hallock, on the Central Pacific Railway. It is built at the very bottom of a valley that extends due north nearly to the Arctic circle, and railroad men say that this valley acts as a great natural wind-pipe which brings the coldest blasts of the North Pole straight down to the county seat of Kitson County, Minn.

Detroit is among the leading cities of the Union in the manufacture of stoves, railway cars and some other specialties. The year 1887 was a prosperous one for all her industries. The Detroit *Tribune* says there are now about 760 concerns in that city, large and small, engaged in some branch of manufacture. Of these 243 are incorporated under the manufacturing laws of the State, the rest being individual concerns or copartnerships. About 60 new companies were incorporated during the year. The aggregate capital employed is in the neighborhood of \$41,000,000, an increase of \$6,000,000 during the year, and the total product approximates \$77,000,000. The manufactories give employ-

ment to an army or 33,000 persons and furnish support to at least half the population of the city. Detroit's various iron manufactures and its shipbuilding are assuming large proportions.

The Minnesota Railroad Commissioners, in their annual report, give it as their opinion that the operation of the Interstate law has been beneficial both to the roads and the public, but that it is not well to prohibit common carriers from reducing their rates at will.

Rents in New York City for the coming year will remain on about the same basis as for the rental year about to close. Landlords have announced no radical changes. It is noticed that importers are more inclined to concentrate below Canal street, while the dry goods district remains about stationary. So, too, of the section between Duane and Barclay streets, where the hardware trade are mainly located; no changes are apparent to indicate that it is less desirable than a year ago. Leases as a rule hold good for at least another year. In the lower wards office rents do not seem to be affected by the completion of new buildings. With the increase of business there is a proportionate demand for accommodation.

Four large sugar refineries have been closed under the recent sugar trust consolidation.

The building of the new Croton aqueduct was attended during 1887 with 64 serious accidents to operatives along the line, 27 of which resulted in death and 37 in serious injury. From the beginning of the work to January 1 this year, 86 men have been killed and 144 seriously injured, making a total to the date mentioned of 230 serious accidents. A synopsis of the fatalities during 1887 on Brown, Howard & Co.'s work, shows that six were killed by rock and bricks falling on them; five were killed by falling down shafts with cars, and two by the cars falling upon them; three by an explosion of dynamite in an old drill-hole, and one by the premature discharge of a blast by lightning; two were burned to death; one was crushed by a descending cage; one knocked his brains out against a projecting timber while pushing a car. Of the five killed on O'Brien & Clark's work, one fell from a wheeling platform; one was killed by falling timber, and three were buried in a cave-in of the tunnel.

Judge Pratt, of Brooklyn, granted an injunction restraining the Hoagland Bros., who are the largest owners in the Royal Baking Powder Company, from paying themselves exorbitant salaries, together amounting to about \$100,000 per annum, with the alleged object of freezing out William Zeigler, a third member of the concern.

The manual training schools under the Industrial Education Association, of this city, are full to overflowing. In response to the announcement that free classes would be opened no less than 1200 candidates for instruction presented themselves. About 14 classes have been formed, who are taught for an hour five afternoons in the week, besides a class for wood working on Wednesday evenings. The association building, No. 9 Washington place, swarms with industrious workers.

Germans, in adapting their educational institutions to the requirements of modern business life, are relegating the dead languages to the crypts, and are schooling their young men in the living dialects of India, China and Africa. The scheme has already become an acknowledged success. Hence Germans to-day are a commercial power in every country on this side of the Atlantic, and in Mexico and Central America they are seriously threatening the

English and French, who preceded them there. So, too, in the Orient. On the Peiho, or the Yang-tse-Kiang, they are quite as much at home with their wares as on the Niger or the Congo, or the marts of the Mediterranean.

The President having received satisfactory proof from the German Government that American vessels and their cargoes are not required in German ports to pay any fee or due of any kind or nature, or any import higher or other than is payable by German vessels or their cargoes, has published a proclamation suspending the collection of the tonnage dues imposed upon vessels entering our ports from any of the ports of the German Empire.

The Grand Jury, at Rochester, New York, brought in two indictments against the Vacuum Oil Company, whose underground naphtha pipes caused an explosion a few weeks ago, with disastrous results. One indictment charges the company with piping a deadly and inflammable fluid through the city and using it in a dangerous and unlawful manner. The other is for using the river as a receptacle for oil, refuse and offal.

The site of the Temple ruins on Chestnut street, Philadelphia, will be occupied by a building to cost \$300,000, for financial institutions.

Experts appointed to examine the elegant arched ceiling of the Assembly room, at Albany, report that it is in a precarious condition, and is liable to fall in a general crash, unless the materials are taken down in a regular way. The report says: "We found that the main vault in two places had settled 3 inches below its original level. All the main ribs which support the central vault were found to be cracked and shattered near the circular keystone. In one of these ribs we found a stone 3 feet long split from end to end in strips. By the side of another rib was a space, split by pressure, 10½ inches long, 7 inches wide and 3½ inches deep. Its defect was not due to the material."

The wire rope supporting the elevator in the wool warehouse of H. H. Hollis, West Fifty-seventh street, broke without warning, and four men were precipitated to the bottom of the shaft, one of whom is likely to die from his injuries. The defect in the rope was attributed to oxidation, due to steam used in dressing the wool. According to one report the examination of the cable when it broke showed that it was simply a hempen rope with steel coiled around it. Had it been entirely of steel experts say that the accident could not have occurred.

A principal feature in the traffic with Mexico from New York City of late is the frequent shipments of machinery, which is taken as an indication of the increasing prosperity of that country.

Capt. I. W. Sherman, of the ship Frederick Billings, sailed on his last voyage all the way from England to San Francisco and back again without seeing one American ship. In his opinion, unless relief comes in ten years more, our foreign carrying trade in American bottoms will be wholly extinct.

The United States Minister to Japan, in his last communication to the State Department, in a deprecatory spirit, calls attention to the fact that the English and Germans have recently been awarded all the contracts for railways and other public works upon which Japan is now entering, while Americans have not had even the poor privilege of competing for them; "and this," says the Minister, "in the face of the fact that I had, for our American iron men and railway constructors and civil engineers, assured this Government that they could and would not only dupli-

cate all such contracts, but at a considerable per centum less than others had bid for them. Nevertheless, the people of Japan trade with us by many millions more than with any other nation. We consume nearly all her tea and over one-third of all her silk, on which no duty is paid at our ports. * * * Other things being equal, therefore, on the score of equal inducements as to prices and qualities, we may unfortunately have cause hereafter to complain that reciprocity in trade, even when the conditions are the same, is ignored, while giving fresh assurances on paper of our long-continued and cordial, friendly relations." The way that Congress fosters commerce with the Asiatic nations is to exclude Chinese from entrance at any of our ports.

The question is asked, What benefit will consumers derive from the proposed reduction of duties on sugar equal to 20 per cent. if the sugar trust monopolizes the supply? Perhaps the trust would consent to an occasional dividend for the benefit of the Federal treasury.

Shipbuilding on the Hudson River has taken a fresh start. At Athens and elsewhere new craft are on the ways. At T. S. Marvel & Co.'s shipyard in Newburg the steamboat Mary Powell is being rebuilt. Among the new work is the building of two steel propellers for the Shore Transportation Company of Providence, R. I.; an iron tug to be called Robert H. Rathbun; a wooden tug to be named the John E. Barwind. Boat builders all along shore say they have work enough to keep them occupied for months to come.

Mr. Cramp, the Philadelphia shipbuilder, has reported to the Navy Department in regard to the vessels building in his yard. The gunboat Yorktown will be launched during the present month and will be ready for a trial of her engines by April 1. The dynamite cruiser is also nearing completion, and will be ready for trial a few days later than the gunboat. Work on the cruiser Baltimore is progressing satisfactorily, and she will be ready for trial about July 1. The cruisers Newark and Philadelphia have been laid down, and the material for their construction is arriving fast enough to guarantee uninterrupted work for some time to come.

The Hudson River ice harvest has been gathered and the crop is estimated as high as 3,000,000 tons, all of the best quality.

The Argentine Republic is receiving emigrants from Italy at the rate of 1000 a day. According to the latest advices, 60,000 were expected to arrive during the month of January, to be dispersed through the agricultural regions of the River Plata. The Buenos Ayres *Standard* says: "The River Plata to-day is an exceptional country. Wages are higher than in Europe or the States; new buildings, new railways and every description of public works are going on so fast that, spite of the thousands and tens of thousands landing, there are few left to people our immense and fertile plains, which can for the next century give homesteads to the whole surplus population of Europe."

W. P. Clyde & Co. are building for their New York, Charleston and Florida line the first steel steamship built in this country for the carrying trade. She will be over 300 feet long, 46 feet beam and over 3000 tons burthen and have triple expansion engines, steel boilers. The proprietors of the line are reported as saying that their choice of steel is due entirely to the reduction in cost in the production of iron and steels caused by the opening and development of the mineral interests of the South.

The New York Chamber of Commerce have resolved to hold a special meeting, 16th inst., to discuss the resolutions adopted by the Shipping League providing

for payments by the Government to American shipping in proportion to the tonnage and miles sailed. They also provide for the carrying of American mails in American bottoms.

The total of claims filed against the collapsed firm of E. S. Wheeler & Co., iron merchants of New Haven, is \$1,459,902. The claims for dividends on the Wicks notes, amounting to several hundred thousand dollars, endorsed by Wheeler, will be contested in court.

Richmond, Va., has a local railway car that is lighted, heated and run by electricity.

The Armory Board awarded the contract for building the Eighth Regiment armory, at Lexington avenue and Ninetieth street, to Isaac A. Hopper, who bid \$284,490 for the entire work.

Steam heat on the local trains of the New York Central proved successful in keeping up a proper temperature during the recent intensely cold weather. The vestibule train for Chicago also has steam heat and auxiliary heaters in each car. As the steam is supplied from the locomotive, the supply gave out, owing to the difficulty of making headway against the drifts, but then the auxiliary heaters prevented serious discomfort.

Korea still acknowledges her vassalage to China, as shown by her memorial to the Emperor of China asking permission to send envoys to Europe, and to open diplomatic relations with the United States. Notwithstanding Korea has certain independent privileges.

The revenue of Cooper Union last year was \$46,056; the expenditures \$45,997.

Much sugar is being imported at San Francisco from Manila and Central America to compete with the Hawaiian trade. It is thought that the refineries in that city will have a surplus of 50,000 or 60,000 tons, which will probably be sent to New York in the raw state. A prominent sugar dealer says: "The Hawaiian crop is estimated to be at least 125,000 tons, while the imports from other sources will amount to 35,000 tons, making the total receipts 160,000 tons." This promises a heavy business for the sugar trust, with corresponding profits if the market can be held up to the present advance.

Both parties in Congress manifest a desire to place themselves in sympathy with the "toiling masses." The House, by a large majority, refused to concur in the recommendation of the Committee on Commerce to refer to the Interstate Commerce Commission for investigation the alleged failure of the Reading Railroad Company to perform its duties as a common carrier of articles of Interstate commerce, and directed the appointment of a special committee to investigate not only that subject, but also the troubles in the Lehigh and Schuylkill coal regions of Pennsylvania.

The arrivals of British steamers at the port of New York in January outnumbered the American almost 5 to 1, the figures being 93 against 21. So the British have not evacuated New York, after all.

Every harbor in Maine was, last week, closed to sailing vessels.

An apparently careful digest of the statistics of immigration for 1887, together with facts contained in the United States census reports, showing the rate of increase of population from natural causes for a series of decades, leads to the conclusion that the present population of this country exceeds 62,500,000, and should immigration continue without interruption, the next Government census will show a population of 66,000,000 or 67,000,000.

The Iron Age

New York, Thursday, February 9, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
JAMES C. BAYLEE AND
CHAS. KIRCHHOFF, JR., - - - EDITORS.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Public opinion has been thoroughly aroused lately to the dangers growing out of the formation of "trusts," and eager to catch public favor legislators have proposed investigating committees, while newspapers teem with condemnatory leaders. It may be conceded that many intelligent manufacturers have lately looked to the methods underlying the modern "trust" as the only means of securing relief from growing expenses and shrinking margins; yet, as a general fact, all but a few of the much-discussed trusts have been flat failures. It is natural that when their formation is being discussed by those engaged in some industry the "trust" is spoken of hopefully, and is quickly pronounced an accomplished fact, often with a great flourish of trumpets. The few small outsiders are ignored, and harmony and success are claimed by all. But the division in the councils which soon creeps in is little heard of, and while the final dissolution is tacitly understood by all interested in a trade, the "trust" continues to flourish in the minds of newspaper writers as a terrible example of grasping monopoly. How many know that the much-talked-of "rubber trust" has not yet been settled; that the "lead trust" is confined to a narrow constituency; that there is no such thing as the "steel rail trust," and that the "stove trust," so urgently advocated, has but little chance of receiving the consent of a modest working majority of the manufacturers? As a matter of fact the only organization of the kind which has thus far proved a conspicuous success is the Standard Oil Company, through the despotic sway of a small group of men.

Again comes the announcement that the coke syndicate, which has been in process of formation for more than two months, will be formed in a few days, possibly during the present week. It is also announced that all existing difficulties between the H. C. Frick Coke Company and the other three members of the old syndicate have been satisfactorily arranged, and that this firm are now ready and willing to join the new pool. A largely attended meeting of the operators was held in the offices of the old syndicate in the Lewis Block, Pittsburgh, on Monday, the 30th ult. During this meeting it was stated that the H. C. Frick Coke Company would join the new syndicate providing their claim against the members of the old syndicate, amounting to about \$80,000, was settled, and also that the new organization would recognize and carry some old contracts for coke which this concern have on hand. After these conditions had been heard, a long discussion took place, when it was decided by the members of the old syndicate to arrange a settlement with the Frick company regarding the money claim, and to shoulder

the old contracts for coke, one or two of which are as low as \$1.35 per ton. The terms of the arrangement were not made public, but it is understood they were entirely satisfactory to every one concerned. From the above it would appear as if the formation of a coke syndicate was a foregone conclusion, and that it will be a matter of only a few days till everything is arranged. We do not believe, however, that such will be the case. It will be remembered that some weeks ago the announcement was made that a syndicate would be formed independent of the Frick concern. This, however, was not done, as the operators know that a syndicate, in order to be a success, must include all producers, and some of the largest independent operators in the region have not signified their intention of joining the pool. Among these are W. J. Rainey, James Cochran and A. C. Cochran, and until these firms and all others agree to join, it will be impossible to form a syndicate and make it successful. During the past few weeks the attitude of the old members of the syndicate toward the H. C. Frick Coke Company has undergone a change, but not without reason. As is well known, this concern controls the output of more ovens in the Connellsville region than any two of the largest firms, and, for this reason, it is practically in a condition to dictate to others upon what terms they will agree to go into a pool. This may seem a strong assertion, but it is true. Of all the coke being manufactured by the H. C. Frick Coke Company at the present time, more than three-fourths of it is being placed on the market for sale, and they have already sold considerable coke to former customers of the members of the syndicate. Should they decide to cut the price in order to make sales, it would probably start a decline in prices that would not be enjoyed by the other operators, who, of course, would have to meet prices, no matter how low they might go. It is safe to assert that, in the event of a syndicate being formed, the H. C. Frick Company will join, but on their own terms.

A controversy of some general interest is going on in Virginia newspapers over the question whether or not that State possesses deposits of good Bessemer ore. Mr. E. J. Hutter, of Lynchburg, wrote to a local paper, with the object of countering the tactics of "boomers," and at the same time asserting that no strictly Bessemer ores have been thus far developed in Virginia in large quantity. Mr. Hutter was promptly met with an array of analyses by leading chemists which would gladden the heart of the average Bessemer furnace man, but he declines to be convinced by samples. He expresses the opinion that "not a carload of ore has ever been mined and shipped of the quality above shown (65.21 per cent. of iron and 0.036 per cent. average phosphorus)." Mr. Hutter goes a step further and makes this proposition: "I will undertake a contract with him to buy, backed by the names of some of the largest capitalists in the country, and further backed up with a cash deposit of \$5000 of their money in a Lynchburg bank, to take, f.o.b. cars at any station within 35 or 40 miles of Lynchburg, 10,000 tons of ore of the quality shown in the above general

average, at the price of \$3.25 per ton—he to give a satisfactory guarantee that he will deliver not less than 4000 tons and at the rate of not less than 500 tons a month, the ore not to contain any titanium and not over one-quarter of 1 per cent. of sulphur, the ore to be paid for in cash as fast as delivered." Whether or not Mr. Hutter will be overwhelmed with James River Bessemer ore remains to be seen. So far as is generally known concerning the deposits of that section the mines thus far developed are not capable of producing enough tonnage of a suitable character to keep one modern furnace going on Bessemer metal.

Exports of Produce from New York.

Produce and merchandise to the value of \$300,000,000 are exported from the port of New York every year. The quantity and valuation of each leading staple exported during the year 1887 are shown by statistics of our foreign commerce, which have been tabulated in detail, together with the prescribed destination, and a comparison with previous years. We make the following synopsis:

	Value.
Wheat, bush.....	41,071,750 \$37,571,455
Corn, bush.....	12,347,567 6,251,315
Flour, bbls.....	4,431,100 18,738,808
Bacon, lbs.....	205,824,308 16,805,904
Petroleum, gals.....	329,489,258 25,365,439
Sugar, lbs.....	95,846,967 5,506,021
Cotton, bales.....	826,665 39,181,375
Lard, lbs.....	198,324,165 14,428,535
Cheese, lbs.....	75,289,602 7,587,755
Live cattle, No.....	33,302 3,213,497

Of wheat England took nearly 14,000,000 bushels, Belgium nearly 6,000,000, France about 5,000,000, Scotland, Spain and Portugal each between 3,000,000 and 4,000,000 bushels. The total exports for 1886 were 31,250,000 bushels, valued at nearly \$28,000,000, the comparison showing that our wheat exports during the past year increased about 25 per cent. in quantity. Flour exports during the past year likewise were about one-fourth larger, the number of barrels exported in the previous year having been 3,466,000. England and Scotland together took nearly 2,600,000 barrels, or more than half of the entire trade. The United Kingdom was also our principal market for meats, though Sweden, Norway, Belgium and Cuba were good customers. Of refined petroleum Germany was last year the heaviest buyer, the shipments to that country amounting to 76,500,000 gallons, against 48,500,000 gallons to England, and from 30,000,000 to 35,000,000 each for Belgium, the Netherlands and British East Indies, Japan following next in order with 10,000,000 gallons. In sugars England and Scotland again lead, taking about 80,000,000 pounds, while British Australia was in the market for 5,252,000 pounds. Cotton exports were principally to England, Germany and Belgium, in the order named, the first mentioned buying 526,600 bales. Provisions were distributed more generally than any other staple in South American markets, and in the West-Indian Islands, for while England leads with about 4,000,000 pounds, large lots, averaging about 5,000,000 pounds each, were shipped to the British and French West Indies, Hayti, United States of Colombia and Venezuela. Lard exports show a heavy falling off, also live cattle. Provisions are less, except-

ing the items of salt pork and salt beef. The value of petroleum exports decreased about \$2,300,000 compared with the previous year. In refined sugar exports the export trade has suffered severely, the loss in valuation being nearly \$5,000,000, or about one-half, and under the operations of the Sugar Trust the outlook is not promising for the year just commenced. The shipments of cotton are decreased about \$4,000,000. Neither producers nor wage earners can afford to be indifferent to the course of the foreign markets. Disturbances of any kind which tend to unsettle values and especially movements that affect the parity of the domestic and foreign markets, have to every class a vital interest.

The New English Merchandise Marks Act.

English manufacturers have succeeded after a good deal of clamor in securing the passage of the Merchandise Marks act, the provisions of which deserve to be closely studied, too, by all who export goods to Great Britain. The aim of the act is, by insisting upon the marking of goods with a true and accurate description of the place or country of manufacture, to protect home producers and consumers alike, and it is radical in its scope. It prohibits importation into England of goods bearing forged trade-marks, whether foreign or British goods brought back. Any imitation of trade-marks if calculated to deceive, or any direct or indirect false indication of origin, will serve as sufficient ground for seizure. Thus English words or firm titles, like "and Co.," if marked on goods not coming from English-speaking countries, bring the articles so marked under the provisions of the act. The place of origin must be distinctly indicated on goods from the United States, or other English-speaking countries, in the case of towns having names similar to those of Great Britain. In such a case the letters U. S. A. would be a sufficient indication. To place the words "hand-made" on machine-made goods is an infringement of the act, and the adoption of devices implying a national character, like the Royal Arms, the Queen's Crown, the Lion of Scotland, or the Harp of Ireland, calls for the addition of a counter-statement like "manufactured abroad."

American manufacturers and exporters will have little to complain of from the passage of such a law, unless, indeed, it is administered in such a manner as to aid obstruction by English competitors. Under the procedure any interested party can claim detention of goods by the English customs officers, provided he gives security to protect the Government from any action for damages. If the complaint is evidently groundless, the goods are delivered. If there is some room for doubt, the customs officers detain them at the risk of the complainant, subject to examination of the case. It is probable that the early administration of the act will be characterized by close if not captious scrutiny, and therefore American manufacturers doing trade in England will do well to avoid trouble by fully complying with the spirit as well as the exact letter of the new law. We have already observed in some of the English trade papers notices of agents of

American producers warning against fraudulent imitation of their registered trade-marks, a course which may be advisable in other cases also.

Incidentally we may remark that the new act is likely to have a serious effect upon a particular method of trading which has grown to large dimensions in England. It has been a source of much sharp complaint that English manufacturers and merchants have had large quantities of goods made in other countries, Germany in particular, ordering them marked as though they were produced in England and selling them as English-made goods. Another interesting point upon which the opinion of the law clerk of the Cutlers Company, of Sheffield, has just been published, relates to the marking by the manufacturer of goods bearing the name, trade-mark and address of a merchant or retailer. It is held that when the circumstances are such that the purchaser is thereby led to believe that the goods were really manufactured by the merchant or retailer at the place at which he carries on business, then the marking is unlawful.

In its conception the new Merchandise Marks act is radical and far-reaching, and it is likely to create quite a revolution in many lines of trade. Its principles will be applauded on this side of the Atlantic, since it aims to protect the honest manufacturer and to furnish to the consumer some guarantee that he is getting what he is paying for.

Late Developments in Venezuela.

The Venezuelan Government has for the second time published an annuary, containing all the official statistics gathered last year and a large map of the Republic. The details show the at present prosperous condition of the country, due on one hand to good administration, and on the other to the appreciation of its chief staple, coffee. The quartz gold mines also continue to give good results.

Venezuela covers an area of 1,155,914 sq. km. of public lands and 383,484 private property, of which 123,241 belong to the agricultural zone, 247,941 to the pastoral zone and 12,302 are forests, constituting a total area of 1,539,398 sq. km. The population on January 1, 1886, was 2,198,320. There are the federal districts, eight States, the Colony Guzman Blanco, that of Bolivar and five Territories. The largest city is the capital, Caracas, with a population of 75,000. About 35,000 foreigners have permanently settled in the country. Although a fund of \$1,000,000 has been set aside to promote immigration of agriculturalists and great inducements are held out to them, it has been found difficult so far to start a steady stream of newcomers of the kind, the River Plata States, Brazil and Chili absorbing the bulk of those leaving Southern Europe for South America, although Venezuela would probably prove as desirable a new home as any of them, possessing as it does most fertile, salubrious table-lands.

Gen. Guzman Blanco having resigned the presidency into the hands of Gen. Hermogenes Lopez, the latter has since creditably filled the post of chief magistrate. The former left for Europe in the spring of 1887, when the difficulty arose about a strip of land on the frontier separ-

ating Venezuela from British Guiana. Being a rich quartz gold region, neither Venezuela nor England feel disposed to yield easily in the matter of this border dispute, which has since been handed over to the Spanish Government for arbitration. General Blanco, meanwhile, attends to the financial interests of his country on the other side. The public indebtedness of Venezuela is comparatively small, 39,285,-692 francs home, and 67,016,250 francs foreign debt. A conversion of the whole is contemplated. This and some railroad loans render General Blanco's stay in Europe desirable. The budget for 1887-88, estimates outlay and income at 27,695,000 francs. The postal service is attended to by 162 post offices, forwarding in 1886 2,734,576 pieces of mail matter at an expenditure of 553,868 francs. In 1886 4462 kg. of telegraph were in operation with 80 offices, the receipts being 239,051 francs, and the outlay 836,188 francs. Like Mexico, Venezuela has been one of the most backward countries in introducing railroads, but for the past ten years good headway has been made. There are in running order 232 kg.; 407 are in course of construction and 1982 authorized, and are being surveyed. Engineering difficulties have been and are great in many localities, while none exist on the "Llanos" between the Cordillera and Orinoco River. The strength of the permanent army is reduced to 2000 men, while the navy does not exceed five men-of-war, three of them being steamers. The merchant marine embraces 2492 vessels of all sizes, of an aggregate tonnage of 24,924, 20 being steamers, registering 2139 tons.

Public instruction is well taken care of. The number of Federal schools in 1886 was 1312, attended by 80,900 pupils; there were besides 645 municipal and private schools, the attendance being 18,566, constituting a total of 1957 schools and 99,466 scholars.

Among gold mines "El Callao" is the leading one. Work commenced in 1871. Since the mine was opened up to January 1, 1886, 239,114 tons of quartz were crushed, producing 911,015 ounces of gold, worth 87,688,958 francs, of which 35,137,-545 francs were paid out as dividends. The Aroa, or New Quebrad, a copper company, shipped to England last year 2261 tons Fine, against 3055 in 1886 and 4074 in 1885. The total shipments of gold and copper in 1886 were worth 28,560,500 francs, against 22,260,236 in 1885. Stock raising is carried on on a large scale; thus there were in 1886 5,275,-481 head of cattle, 4,645,858 sheep and goats, 622,306 horses and mules, 769,920 asses, and 1,439,185 hogs—together 12,-752,750, against 3,302,072 in 1873.

The import into Venezuela in 1886 was 47,168,277 francs' worth of goods, and the export 82,304,289 francs. The American trade was as follows:

Fiscal year.	Import into the U. S.	Domestic expt'd to Venezuela.
1887.....	\$8,261,236	\$2,827,010
1886.....	5,791,621	2,695,488

The increase is due to the rise in coffee. In 1886 2460 sea-going vessels, 637 being steamers, entered Venezuelan ports.

For the purpose of encouraging immigration and practically demonstrating what may be done in the way of colonization by white settlers in the coffee region of Venezuela, two colonies have been founded,

one being called Guzman Blanco and the other Bolivar. In ten districts of the former there were last year in a flourishing condition 417 estates, with 2,073,500 coffee trees, 292 acres planted with cane, and 490 with manioc and other plants, there being 1599 settlers. Bolivar colony has 450 settlers, owning 14 coffee estates with 16,000 trees each, and 200 truck farms. Each colony is under a governor appointed by the national Government. As Venezuela does a larger trade with the United States than with any other country, it is gratifying to note the growing prosperity of the republic.

The Blast Furnaces of the United States on February 1.

Special interest attaches to a study of the blast furnace capacity now at work, since the business is recognized to be balancing closely between the efforts of buyers to depress the market and the endeavors of sellers to prevent a decline.

The effect of the strike in the anthracite region is worthy of special study, even to producers west of the Allegheny Mountains, to many of whom the sudden demand for coke from that quarter is a serious factor in the question of the future prices for the fuel they use.

The status of the anthracite furnaces is as follows:

Anthracite Furnaces in Blast, February 1.

Location of furnaces.	Total number of stacks.	Number of furnaces in blast.	Capacity per week.	Number of furnaces out of blast.	Capacity per week.
					Capacity per week.
New York.....	29	23	3,542	16	4,576
New Jersey.....	15	5	1,724	10	3,145
Spiegel.....	9	12	150	1	63
Pennsylvania :					
Lehigh Valley.....	48	30	8,470	18	5,082
Spiegel.....	1	0	0	1	40
Schuylkill Valley.....	41	17	5,432	24	4,814
L. Susquehan. Val.	24	10	2,048	14	4,072
Lebanon Valley.....	15	11	4,732	4	2,290
U. Susquehan. Val.	18	9	2,976	9	1,625
Maryland.....	4	0	0	4	832
Total.....	138	97	29,980	101	26,532

Furnaces in blast.	Capacity per week.				
		Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.
February 1, 1888.....	97	29,980	97	29,980	0
January 1, 1888.....	118	33,206	118	33,206	0
December 1.....	122	39,487	122	39,487	0
November 1.....	124	40,028	124	40,028	0
October 1.....	123	39,440	123	39,440	0
September 1.....	125	38,328	125	38,328	0
August 1.....	129	37,930	129	37,930	0
July 1.....	134	40,742	134	40,742	0
June 1.....	138	44,188	138	44,188	0
May 1.....	137	43,802	137	43,802	0
April 1.....	139	43,585	139	43,585	0
March 1.....	141	43,724	141	43,724	0
February 1.....	137	41,951	137	41,951	0
January 1, 1887.....	130	40,735	130	40,735	0
December 1.....	119	36,820	119	36,820	0
November 1.....	116	36,348	116	36,348	0
October 1.....	114	35,819	114	35,819	0
September 1.....	112	34,207	112	34,207	0
August 1.....	120	36,841	120	36,841	0
July 1.....	117	36,762	117	36,762	0
June 1.....	121	38,239	121	38,239	0
May 1.....	119	39,924	119	39,924	0

The effect of the coal strike is clearly apparent from the large reduction in the output of anthracite pig iron, to which, however, other causes like the falling off in the requirements of Bessemer pig contribute also. New York and New Jersey have not been affected, except by keeping plants out of blast which, like the Andover, would otherwise be running. The only furnace reported as having gone out on account of the scarcity of the right coal is one of the furnaces of the New Jersey Zinc and Iron Company. This, too, is partly due to the fact that the company controlling the

plant has a considerable stock of spiegel. In the Lehigh Valley one of the Carbon furnaces is out, and the third is soon to stop. The Allentown Iron Works has only one running, one of the three Coplay only is producing, three of the five Crane furnaces are out, two of the Glendon stacks are idle, and Durham, the largest single stack in the valley, blew out on the 22d ult. for want of coal. Of the 12 Thomas furnaces two are out, two others are running on all coke, and the others are on half coke. It is a remarkable fact that the two furnaces on all coke are not doing as well as on all coal, so far as quantity produced is concerned, and that they are only making hard iron. In the Schuylkill Valley two of the Brooks furnaces are reported in on the 1st, Edge Hill was out, No. 2 Keystone was put out because the lining gave way, Lucinda was banked, Marion and Elizabeth are idle waiting for better prices, Mount Laurel is running on coke, Norristown is producing, and the two Phoenix were in. The two Pioneer furnaces were banked on the 9th ult., and are still in that condition. Plymouth is smelting with coke, the two Reading, Temple and Warwick were reported to us officially as working; Chester is making iron. In the Lower Susquehanna district one of the Chestnut Hill furnaces was banked on the 16th for want of coal, the two Chickies were working, as is Katherine, Lochiel, Paxton and Vesta. Cordelia is banked and four of the furnaces of the Pennsylvania Steel Company are now idle, two having been blown out in January, chiefly probably on account of slackness in the rail trade. In the Lebanon Valley the two Bird Coleman furnaces are reported to have stopped operations, while Sheridan, Lebanon, Lebanon Valley and Robesonia have turned to coke. In the Upper Susquehanna, Bloom, Duncannon, Irondale, Marshall and Montour are making iron, and four Lackawanna furnaces are at work. The fact that Union is waiting for the ending of the strike is the only indication of any effect of the troubles at the mines. In Maryland the only Ashland furnace active blew out on the 15th ult.

The status of the bituminous and coke furnaces was as follows:

Bituminous and Coke Furnaces in Blast February 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
					Capacity per week.
New York.....	0	0	0	3	3,900
Pennsylvania :					
Pittsburgh district.....	19	15	12,857	4	6,100
Spiegel.....	1	1	563	0	0
Shenango Valley.....	19	13	8,055	6	3,042
Juniata & Conema.....	22	13	5,652	9	2,185
Spiegel.....	1	1	297	0	0
Youngs Valley.....	5	3	892	3	1,061
Miscellaneous.....	12	12	985	0	0
Maryland.....	12	0	0	2	310
Virginia.....	12	8	3,848	4	1,885
West Virginia.....	6	2	1,691	4	1,730
Kentucky.....	4	3	835	1	300
Ohio :					
Mahoning Valley.....	14	10	6,501	4	3,206
Hocking Valley.....	15	9	2,115	6	1,250
Hanging Rock.....	14	10	1,669	4	835
Miscellaneous.....	17	11	7,195	1	3,201
Illinois.....	16	11	11,061	5	2,940
Missouri.....	8	2	1,687	6	2,820
Wisconsin.....	8	2	1,037	1	680
Indiana.....	2	2	355	0	0
Michigan.....	1	0	0	1	290
Alabama.....	13	9	3,360	4	1,675
Tennessee.....	9	2	3,255	2	830
Georgia.....	12	8	812	0	0
Colorado.....	1	1	490	0	0
Total.....	211	136	73,912	75	37,760

No. of furnaces.	Capacity per week.
186	73,912
148	63,101
144	58,835
151	90,459
152	89,123
145	83,194
113	62,091
98	47,319
148	44,965
148	83,509
146	81,796
145	79,257
137	73,422
139	73,795
140	73,013
136	70,802
135	69,206
133	68,852
132	71,316
129	70,766
129	67,888

In New York the Troy furnaces are banked on account of labor troubles. In the Pittsburgh district furnace A of the Edgar Thomson plant has been blown out and B is banked, leaving only F and G in blast. Three, B, C and E, are banked on account of the depression in the pig-iron market, and will probably not resume until the steel works, which have been idle since December, start up again. It is estimated that the closing down of these furnaces reduced the output of Allegheny County last month about 24,000 tons. In the Shenango Valley Claire, Douglas, Ella, Etina, Florence, Mabel, Neshannock, Raney and Berger, Rosina, one Sharon, Sharpsville, Spearman and one Stewart were running on the 1st, Fannie and Keel Ridge being banked. We may state in this connection that we place furnaces banked in the same category as those out of blast. In the Juniata and Conemaugh valleys the entire plant of the Cambria Iron Company, with the exception of one furnace at Johnstown out of six, was producing. In the Youghiogheny Valley Charlotte and both Dunbar furnaces were idle on the 1st inst. Fayette, which was troubled by a strike of the men during January, went in again on the 1st inst.

In Virginia Gem was banked from the 18th to 31st, the mines being frozen. Pulaski, the new furnace, has just been added to the list of producers. In West Virginia Belmont is out, and Top Mill, which was banked on the 20th of December, is still in that condition. It will, however, be blown in during the current month. Irondale blew in on the 5th ult. after putting in a new bosh. In Kentucky the new No. 2 stack of the Ashland Company was blown in on the 30th, and is reported to be doing well.

In the Mahoning Valley, Ohio, Himrod has stopped, while Hasleton, on the other hand, went in on the 16th ult. In the Hocking Valley there have been no changes. The Floodwood furnaces will be ready to begin operations in a few weeks. In Central and Northern Ohio Emma and Steubenville have gone out of blast.

In Illinois one of the Joliet furnaces went out on the 23d ult. Chicago is running two, South Chicago four, and Union three; these works, with Joliet, having made in January 50,505 gross tons of pig iron. In Missouri only Jupiter and one of the three furnaces of the Western Steel Company are at work, Missouri Furnace being stopped on the 15th. There has been no change in Wisconsin or Indiana.

In Alabama one of the Sloss furnaces has been out of blast for repairs since the 8th ult. The new Sheffield Furnace has again gone out of blast. In Tennessee,

Chattanooga is to go into blast again soon, and Citico in May. The two Dayton, two Rockwood, two South Pittsburgh, and Sewanee were running on the 1st inst.

So far as the charcoal furnaces are concerned we may note that two Richmond are now running instead of one a month since. On the other hand, both of the Plattsburgh furnaces, in New York, are out, though one of them will go in in a few days. Millerton, too, has stopped producing for the present. Eagle, in Pennsylvania, is putting in a new hearth, and will be in operation in a short time. In Maryland only one of the Stickney furnaces is running, and that is to be banked or blown out on the 11th inst. In Kentucky Bellefonte and Hunnewell are running. In Virginia Beverly is out till May, and Cedar Run, Eagle, Raven Cliff, Reed Island, Speedwell and Wythe are not expected to go in before that time. Pierce and Walton only are making iron, and the latter is to go out in a few weeks. White Rock will make a short blast, beginning about March 1. In the Hanging Rock region there have been no changes of consequence. In Michigan Gogebic went into operation on the 15th ult. Among others, Antrim, Bangor, Elk Rapids, Gaylord, Martel Spring Lake and Peninsula are at work. In Wisconsin National has gone out. In Tennessee Etna, La Grange and Warner report officially that they are producing. In Alabama both Shelby are again at work; Rock Run is in, as is Tecumseh and the two Woodstock. The latter were banked for more than half the month. On the whole, therefore, there has been little change in the capacity producing.

The Credit System.

That the National Board of Trade at its recent meeting in Washington should have listened with approval, and even with enthusiasm, to a proposition to abolish the credit system from our business dealings, is certainly very significant. Mr. John A. Price, of Scranton, a prominent manufacturer of that city and president of the Scranton Stove Works, advanced this proposition in a very clear and able paper. It expressed his convictions, and contained a formidable array of facts showing the evils of the credit system, which he has been at great pains to collect. We may assume, however, that he had very little idea that it would be well received as a serious proposition. The tendency has been steady in the direction of an unlimited extension of credit for a hundred years, and it is scarcely conceivable that business could be carried on without an elastic credit system, during most of the time stretched to the limit of tenuity. The members of the National Board of Trade, however, are representative business men, and their cordial approval of a proposition so startling seems to show that in the judgment of those most concerned the evils of the credit system are quite as great as its benefits.

Mr. Price's argument may be indicated by a brief summary of its leading points. The silent development of socialism, by which is meant popular discontent with existing conditions, is traceable to the power to create, maintain and collect indebtedness. The credit system is the

most costly and disastrous expedient ever devised by man to complicate and disturb social relations, and history furnishes no record for it save one of calamity. National indebtedness in many parts of the world has already passed beyond the limits of prospective payment, unless through reborrowing. During the past century the deficits in national accounts have maintained a steady increase, with scarcely any intermittent interruption, relying solely on the credit prerogative. Prior to 1848 it is found impossible to formulate any considerable and satisfactory schedule of the aggregate national indebtedness. In the short period of 40 years the temptations for borrowing have increased with the facilities, and a careful and conservative observer like Lord Derby asserts that the nations of Europe will sooner or later repudiate their national debts, and that the sum of \$800,000,000 per annum to liquidate the annual interest account is a tax upon the labor of Europe to which it cannot respond and live. The debts of the nations of the world to-day exceed \$25,000,000,000, having increased 300 per cent. since 1848. The national debts of Europe now aggregate about \$22,500,000,000, on which the interest annuity is \$800,000,000, and it is safe to say that the process of disintegration will begin before the present century ends, and that repudiation is almost as certain to rise on the incoming century as the sun. Spain, Portugal, Austria and Greece are bankrupt; Russia and Italy are without credit, and the great States of Great Britain, France and Holland are exhausting every measure of taxation to maintain solvency and credit. These enormous figures give us in fact a mortgage of over \$30 per acre on the land, or upward of \$100 per capita on the population. In addition to the nations enumerated we discover a kindred recklessness in borrowing in Brazil, which has pledged "all the resources of the empire;" in Mexico, which has virtually repudiated; in Egypt, which has fallen in helpless submission under the lash, without sufficient spirit even to repudiate; in Japan, whose development of debt is already beginning to fester into rebellion.

The same remarkable tendency discovered in the finances of nations is seen in that of States, counties and municipalities. In 1880 the sum of these indebtednesses in the United States, exclusive of the national debt, was \$1,048,084,041. The railroad indebtedness in that year was \$2,693,364,882, and had increased in 1886 to \$4,163,640,144—nearly \$1,000,000,000 more than their capitalization. Banking institutions in 1886 carried a line of credits aggregating \$4,581,706,203, and private bankers further swelled the enormous total to an unknown extent. These figures are significant or not according to the relation they bear to values and population. Thus compared they are certainly disquieting. In Great Britain mortgages of record in one form or another cover two-thirds of the values of record. Germany is loaded to the breaking point. Three-quarters of the property in the cities of the Empire is thus covered. Holland is in much the same condition, but France is better off. Turning to the countries which have always been characterized by unthrift and improvidence, we find everything heavily mortgaged. The list is too

long to follow, but the conclusion is inevitable that very few countries, if any, will be able under the most favorable circumstances to lift the burdens which are crushing them. Universal bankruptcy seems to be inevitable.

To the constantly growing sum of obligations which constitute our credit system must be added an enormous total of public indebtedness contracted by minor divisions of the State, corporations, firms and individuals. For our own country the showing is assumed to be about as follows:

Present national debt, December 1, 1887.....	\$1,675,816,660
State.....	226,597,594
County and municipal.....	821,486,447
Railway.....	4,163,640,144
Banking.....	4,581,706,203
Private banking.....	1,500,000,000
Record.....	6,000,000,000
Mercantile.....	3,000,000,000
Individual, otherwise than above.....	6,000,000,000
Aggregate.....	\$27,969,247,048

This total is more than one-half the entire census valuation of 1880. If our population is 60,000,000, it means a per capita indebtedness of \$465, or more than the average income of the family in Massachusetts.

The remedy for this appalling condition of affairs, if we understand aright the argument of Mr. Price, which we have thus far followed, is the abolition of laws for the collection of debt, thus withdrawing from the creditor the protection of the State, and compelling him to seek safety by guarding against the abuse of the credit system. It is built upon a system of laws which are a sword and shield to the strong and death to the weak. Without such protection the credit system will shrink to normal and safe proportions, and a process of gradual liquidation will be possible.

Such a contribution to current literature as we have above outlined is well calculated to challenge attention. Its facts are conceded, its propositions are obvious. The remedy proposed is, we think, the only practicable one ever suggested. No doubt the shock would be severe, but it would be temporary, and it can be invited more safely than the inevitable consequences of the present system can be awaited. Mr. Price says:

We have resorted to bankrupt acts that have proven to be only spasmodic and unsatisfactory in effect, causing greater evil and degeneracy than that which they sought to reform. Socialistic legislation is slowly creeping into such great States as those of Massachusetts, Pennsylvania, Illinois and New York. We are entering upon a period when the spirit of the demagogue will be very assertive, and we may well recognize the cry of an hundred years ago which swelled into the thunder of the French Revolution. The law to sustain the unrestricted exercise of credit is the chief factor in centralizing wealth, and the ability to call upon the State to enforce the will of the individual, however it may be applied, is becoming obnoxious in the extreme. The credit system is one of the arts by which individuals, corporations and nations can more completely summon and control the energies of the mass of people, and which enables them to build pyramids of fortunes instead of stones, and which likewise is destined to sink into Cimmerian darkness. Every fall of the sheriff's hammer, consequent upon the plots and counter plots of credit manipulators, by which values are fancifully created or ruthlessly destroyed, may be set down as a potent and a warning cry that the State is treating an unfortunate as a criminal, and inspiring a protest that must be recognized by some definite and radical relief.

These are solemn truths very earnestly stated. The present generation may per-

haps be able to leave to the next the heritage of evils we are piling up, but even this is doubtful. The subject is urgent, its discussion timely.

From year to year the cost of production of all the leading copper mines in Lake Superior can be closely computed from the published reports, with the exception of the Calumet and Hecla Company. Taking as the basis those of the year 1886, the figures not having been compiled as yet for 1887, it is interesting to note what profits the leading companies could reap could they realize 16 cents for the whole year's output. Below we give the results of such a calculation:

	Output 1887.	Cost in Profits in 1886. 1888 at 16c.
Atlantic.....	3,641,865	9.50c. \$237,250
Central.....	2,199,133	8.74c. 259,500
Franklin.....	4,000,000	9.40c. 264,000
Quincy.....	5,603,691	6.75c. 508,750
Tamarack (esti. 1888).....	12,000,000	6.75c. 1,110,000
Calumet and Hecla (for 1888)	28,000,000	6.50c. 2,660,000

We have assumed that the Tamarack will produce 12,000,000 pounds in 1887, and that the Calumet and Hecla on the basis of running only that part of the mine not touched by the fire. But let it be assumed that the companies named entered into an agreement with the French syndicate to sell their products at 13 cents plus one-half the excess over that price. Then, at an average of 16 cents, the profits would be:

	Profit. 1888.	Dividend. 1887.	Total to date.
Atlantic	\$182,500	\$40,000	\$360,000
Central	126,500	40,000	1,820,000
Franklin.....	204,000	40,000	600,000
Quincy.....	426,250	200,000	4,610,000
Tamarack.....	930,000

The Calumet and Hecla paid in 1887 dividends aggregating \$1,000,000, making its total \$29,350,000. Even if the mine fire is not stopped, the gross earnings of the company would be over double the 1887 dividend, deducting a fair amount for cost of fighting the fire and for new equipment being completed but on which work is now stopped. So far as the Tamarack is concerned, the total amount paid in was \$13 a share, or \$650,000, so that one year's profits may recoup the original investors and leave them a magnificent property free. With such results for the leading Lake mines it seems only too likely that before 1888 is over new ventures will come into the field, old concerns will be revived and going mines will increase their capacity to get ready for the great struggle to come.

The remarks of Sir John Pender, as chairman of the Panucillo Copper Company, of Chili, at the recent extraordinary general meeting of the shareholders in London, are interesting in connection with the operations of the French copper syndicate. Sir John Pender in his speech stated that the company had been producing of late about 2000 tons of copper annually, and claimed that they can pay their way with copper at about £38. It appears that the syndicate in opening negotiations with the company found the latter unwilling to enter into any agreements unless it be allowed to produce annually 3000 tons, on the claim that its arrangement permits an output of 4000 tons annually. At the meeting the chairman stated that they were then negotiating with the company for the sale of its copper for three years. It is reported since then that these negotiations have terminated favorably, on the basis of about £60 per ton, which would give the company dividends at 20 per cent. per annum.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 8, 1888.

The Committee on Ways and Means held a short meeting to-day, did nothing, and adjourned. The chairman, however, intimated that he would be ready to submit the outline of a general measure of revenue reduction possibly next week. The recovery of Speaker Carlisle and his resumption of the chair has given fresh impetus to business in committees and the House. Although Congress is in the third month of the session, no measure of national importance has yet passed, or, in fact, been reported. From these indications a protracted session may be expected, in all probability extending well into the summer solstice. In the face of a national election embracing in its scope the election of a chief magistrate to administer the executive of the Government, a Vice-President, the official heir presumptive to the executive office in the event of the contingencies of the death, resignation, or inability of the President to perform the duties of the supreme office, the election of Legislatures to fill the expiring seats of the Senators of the class of 1889 and Representatives to provide revenues appropriate for the expenses of the Government, and assist in making laws during the Fifty-first Congress, it becomes a matter of importance to both parties to make up well the record of public usefulness to be judged by the discriminating notes of the people.

During the past week the parliamentary tilt over the contested case of White, of Indiana, the Republican sitting member, and Lowry, the Democratic contestant, had more than a simple partisan significance. The Republican member was seated by a vote so overwhelming in a house controlled by a fair working majority of Democrats that it was accepted as a foreshadowing of the purpose of the protection Democrats to permit no party considerations to stand in the way of fortifying their position at all points. The 30 Democrats who stand with Randall, McAdoo and the protection Democratic leaders voted to seat White. The Irish Representatives did the same. These two elements, actuated by different purposes, but with the same results, demonstrated that the protection Democrats were in earnest against any hostile legislation affecting industry or labor, and the Irish members were opposed to legislation calculated to open American markets to British manufacturers or the products of underpaid British labor.

The Democratic leaders, in an informal conference to-day, admitted that the action of yesterday on this contested election case was ominous. They seem to be all adrift as to how to meet the issue. The attempt to seat Lowry, a free-trader, beaten in a 2000 Democratic majority district by 2500 majority for a protection Republican on a mere technicality, was voted down by a majority so overwhelming that it is doubtful whether any more experiments to gain votes in the House by the usual partisan weight of numbers will be undertaken.

The Democrats of the Committee on Ways and Means continue their meetings and say that they have had their bill very nearly completed several times, but with putting in items and taking them out, putting down duties on certain articles and putting them back and generally trying to find a line of compromise between conflicting interests, they have met with repeated delays. The administrative bill, left as a legacy by Representative Hewitt, is about the only proposition upon which the Democrats of the committee really unite. The illness of Speaker Carlisle has caused a delay which it is expected will

now be obviated. Since his return from his Fortress Monroe trip he has given the efforts of the committee his attention, and has eliminated many objectionable features from the bill. The message of the President was not in accord with his views as leading to a feasible measure. He is in hearty accord with its doctrines, as he admits, but as he says: "We are not preparing a system of revenue reduction to carry out in a direct line the views which we personally entertain. There are certain antagonisms which must be considered. Therefore, we must do the best we can in framing a bill which we think we can pass." The speaker is not feeling much encouraged. Chairman Mills before introducing the bill for reference will give the whole committee an opportunity to go over that measure and all of the bills which have been referred to it.

Speaker Carlisle has experienced great difficulty in securing Representatives to serve on the special committee on the Reading strikes. He opened the way to that rugged road to Congressional fame to a large number of Representatives, but none were willing to avail themselves of the opportunity to cover themselves with that kind of distant glory. The comforts of the Hall of the Representatives and the gayeties of the capital present too violent a contrast to the snow-covered, ice-bound regions of coal and confusion to tempt the law-makers of the nation.

The New York Senators, Evarts and Hiscock, and the Albany and Troy Representatives, Tracy and Greenman, are pushing Watervliet as the site of the National Gun Foundry for all it is worth. Three bills to the same end, appropriating \$1,000,000 for the purpose have been introduced, but the Committee on Coast Defenses are slow in coming together.

Among the bills now pending before the House Military Committee is one introduced by Mr. Collins, to authorize the Secretary of War to contract with the South Boston Iron Works for the construction of 100 12-inch rifled cast-iron muzzle-loading mortars, said mortars to fire projectiles of not less than 615 pounds weight, and to have a maximum of range and an accuracy of fire at least equal to the 12-inch cast-iron steel-hooped rifled mortar now at Sandy Hook, owned by the United States and built by the South Boston Iron Works. For this purpose \$600,000 is appropriated. Lieut.-Gen. Sheridan, who favors the bill, says the cost of 50 mortars of 12-inch caliber, carriages included, will not exceed the cost of five 100-ton guns and their carriages. Besides their first cost the mortars can be placed in very inexpensive sunken emplacements.

Among the samples of open-hearth steel recently tested by the Inspection Board of the Navy Department is one which gave the following results: It was for the 1-inch protection deck plates rolled from ingots 15 x 23 inches. The specimen had a diameter of $\frac{1}{4}$ inch and was 3 inches long. The elastic limit was 43,010 pounds, ultimate strength 63,820 pounds, elongation 39.66%, reduction of area 55.57%, elongation of tensile limit 21%. Analysis showed carbon 0.19, manganese 0.48, phosphorus 0.05, and sulphur 0.023.

The resignation of R. W. Hunt, general manager of the Troy Steel and Iron Company, of Troy, N. Y., has been accepted, to take effect March 1.

William Floyd, superintendent of the steel department of the Homestead Steel Works, at Homestead, Pa., has been promoted to assistant-superintendent of the entire works.

TRADE REPORT.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 8, 1888.

There has been no change for the better in the market for Pig Iron. On the contrary, a weak undertone still obtains. The production in most districts is still on a large scale, that causes steady accumulations of supplies despite the heavy consumption. At the same time the "bear" interest in the speculative departments keeps industriously at work, and in not a few instances merchants are underselling makers' prices. Besides these conditions there is an element of weakness in the fact that outsiders who bought heavily during the "bull" fever in December and early last month are tiring of their burden and selling out. Scotch warrants have been as low as 39/6, and Hematite warrants touched 42/. There was a partial reaction within the past few days, due to covering of "short" sales; but renewed selling pressure set in again to-day, and prices dropped to the lowest of the week. Makers' brands are again lower. In the case of Scotch Pig about 6d down on Middleboro', and about the same on Bessemer.

Although not as active as previously, of late there is still a good trade in most branches of the Steel trade. Prices are a trifle irregular on Blooms and Rails, but otherwise firm. The Germans have secured an order for 7500 tons of Rails for Chili, on which English makers competed. Manufactured Iron continues fairly active, and prices are firm with about 2/6 advance on Staffordshire Common and Welsh Bars.

No new announcements of an official character of agreements between Copper producers and the syndicate have appeared the past week. It is the general belief in well-informed quarters, however, that there is a tacit understanding between the syndicate and all prominent producers whereby prices will be kept from falling below their present level. This belief is even shared by the more conservative merchants who have been skeptical as to the success of the syndicate in its undertaking. The speculation has been quite animated. The visible supply in England and France is about 1000 tons larger than at the beginning of the year and about the same as reported the middle of last month. No sales have been reported of American Matte Copper during the past fortnight.

Pig Tin is offered very sparingly for prompt or near future delivery. Pig Lead has weakened after showing some advance, and Spelter has dropped materially under the weight of pressure to make sales.

The Tin-Plate market remains in a disturbed condition, owing to the failure thus far of the attempts to form a satisfactory combination. The idea of fixing a minimum price is practically dead, and the subsequent endeavor to reduce the output by a general restriction of working hours has, as yet, led to no really important results, although several makers are, on their

individual account, working fewer hours. Under the conditions prevailing the past six weeks stocks have increased largely at the shipping points, and sales at a shade under the generally quoted prices have not been infrequent since the first of the current month.

Scotch Pig.—Sales have again been slow and prices are still unsettled and weak

No. 1 Coltness,	f.o.b.	Glasgow,	49.6
No. 1 Summerlee,	"	"	50/
No. 1 Gartsherrie,	"	"	46.6
No. 1 Langloan,	"	"	48.6
No. 1 Carnbroe,	"	"	42/
No. 1 Shotts,	" at Leith.....	"	47.6
No. 1 Gengarnock,	" Ardrossan	"	46/
No. 1 Dalmellington,"	"	"	42/3
No. 1 Eglinton	"	"	42/
Steamer freights, Glasgow to New York, 6/ @ 7/; Liverpool to New York, 7/6.			

Cleveland Pig.—Prices have declined under freer offerings and more restricted demand. No. 1 Middleboro', G. M. B., 34/; No. 3 do., 21/6, f.o.b.

Bessemer Pig.—The market still irregular and unsettled; outside lots selling below makers' prices. West Coast brands, mixed numbers, 43/6, f.o.b.

Spiegeleisen.—Trade has been moderate, but prices are held firmly. English 20% quoted at 75/, f.o.b.

Steel Rails.—Fairly active demand, but some irregularity in prices. Standard sections, £4 @ £4. 2/6, f.o.b.

Steel Blooms.—Demand runs fairly and prices are firm. We quote at 72/6 @ 75/, f.o.b., for 7 x 7.

Steel Billets and Slabs.—Only a moderate business passing, but prices steady. Bessemer 2½ x 2½ inch Billets, £4. 5/; and Nail Slabs, £4. 2/6, f.o.b.

Steel Wire Rods.—Sales moderate, but prices steady. Mild Steel, No. 6, quoted at £5. 17/6 @ £6, f.o.b.

Old Rails.—The market dull and prices rather weak. Tees quoted at £2. 15/ @ £2. 17/6, and Double Heads £2. 17/6 @ £3, c.i.f., New York.

Serap Iron.—Very little doing and prices nominal. Heavy Wrought at 47/6 @ 52/6, f.o.b.

Crop Ends.—The market quiet, and prices barely steady. Bessemer quoted £2. 5/ @ £2. 7/6, f.o.b.

Tin Plate.—Trade has been moderate, and prices continue rather weak. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	16/6 @ 17/
IC Bessemer steel, Coke finish.....	14/9 @ 15/6
IC Siemens	15/ @ 15/3
IC Coke, B. V. grade	14/9 @ 15/
Charcoal, Terne, Dean grade	13.6 @ 13/9

Manufactured Iron.—There is still a very good demand for most descriptions, and prices are firm. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ord. Marked Bars....	7 10 0 @ 7	12 6
" Common	5 2 6 @ 5	5 0
" Blk sheet, singles	6 15 0 @ 7	0 0
Wels' Bars (at Wales).....	4 15 0 @ 4	17 6

Tin.—Moderate offerings, and the market firm but quiet. Straits closed at £169. 10/, spot, and £145, three months' futures.

Copper.—The market firm, though quieter. Chili Bars closed at \$76. 10/. Best Selected, £79 @ £80.

Lead.—The market irregular, with rather weak tone to-day. Soft Spanish, £14. 10/ at the close.

Spelter.—Prices have weakened under pressure to make sales. Silesian, ordinary, £18. 15/ at the close.

Financial.

OFFICE OF THE IRON AGE, |
WEDNESDAY EVENING, February 8, 1888. |

The war scare in Europe, a fierce cutting of rates by Western roads and the miners' coal strike, in its varying aspects, have all had their influence during the week in business circles. A favorable circumstance was the raising of the snow blockade, permitting free transportation. Bismarck's speech in the Reichstag, on Monday, afforded relief to the money markets of Europe, which had become weak and panicky, owing to the publication of the Austro-German treaty, and reaction was immediate, the bourses closing strong. The coal miners' situation is complex, but the number of collieries resuming increases from day to day. A fruitful source of disturbance is the incessant cutting of freight rates by rival roads, which, however, Commissioner Fink thinks will not extend to the Eastern trunk lines. In the Northwest the decline in rates is about 60%. Tariff legislation is still delayed, nor has a bankruptcy bill been introduced in either House of Congress.

The Stock Exchange markets are generally lower, but as compared with Saturday there is little change. Fluctuations have been governed mainly by news from the coal mines and reports respecting the freight war on Western roads. On Thursday there was a decided movement in Chesapeake and Ohio securities. On Friday there was a pressure to sell on orders from Chicago, and another feature was a rise in Western Union. The action of miners in the Wyoming regions calling for a 15% advance caused some weakness in Lackawana and Delaware and Hudson. Reading was attacked, but the stock was readily taken. On Saturday lower prices in London and an assault on the grangars and coal shares had an unsettling effect. The peaceful tenor of Prince Bismarck's speech and consequent recovery of prices in Europe was reflected here in stronger markets on Tuesday, with more active trading, but to-day nearly all the advance was lost. United States bonds closed as follows:

U. S. 4½, 1891, coupon	107½ @ 108½
U. S. 4½, 1907, registered	125½ @ 126½
U. S. Currency 6s, 1895	121 @
U. S. Currency 6s, 1896	122 @
U. S. Currency 9s, 1867	121 @
U. S. Currency 9s, 1898	26 @
U. S. Currency 9s, 1901	128 @

The total bank clearances in 36 cities show a decrease of 2.2%, against a decrease of 13.8% the previous week. Outside of New York there is an increase of 13.3% as compared with last year. The exhibit is the most favorable presented thus far this year.

The weekly bank statement shows that the influx of currency is still large, as the banks gained nearly \$1,000,000 in cash. There is a loss of \$664,050 in surplus reserve, but this is due to the heavy expansion of loans, which increased the deposit liabilities over \$6,600,000. The banks still hold \$22,594,775 in excess of the 25% legal requirements. Easy money has been more noticeable ever since the beginning of the year, and within the past week time loans have been offered at 3½% for 90 days, and 4½@ 5%, four to six months, on first-class collateral. An easier feeling prevailed after the reception of more pacific advices from Europe, as several important American railway loans are pending in London and Berlin, and bond dealers in the New York market report a better inquiry. The absorption of American securities abroad within the last few weeks is estimated at \$40,000,000 and is construed as an augury of renewed activity in railway construction. Advices from Washington are to the effect that the Ways and Means Committee are favorable to a bill to authorize the Treasury to purchase bonds. The Treasurer of the United States announces that

he will issue silver certificates of the denominations of \$1 and \$2 in return for national bank notes or for United States notes or silver certificates mutilated or unfit for circulation only, received for redemption under the regulations now in force. A petition to Congress has been very generally signed by representative business men in this city, having for its object the amending of the Revised Statutes so as to provide that the duties on imported merchandise shall be assessed upon the quantity delivered from warehouse, instead of the quantity entered into warehouse, and, furthermore, that the bonded period be extended to five years.

The imports of merchandise for the week were valued at \$9,059,000, of which over \$3,000,000 represent dry goods, making a total since January 1 of \$46,280,800, as compared with \$41,837,000 for the same time last year. Exports for the week amounted to \$6,086,000, and since January the total is \$29,706,000, against \$27,186,600 for the corresponding period last year and \$35,325,600 in 1886. The items include 127,000 barrels flour, 212,700 bushels wheat, 19,527 head of cattle, 6,751,000 gallons of petroleum, 4,700,000 pounds cut meats.

The tax banking system of the Dominion of Canada is the topic of an Ottawa correspondent, who states that there are in Canada 42 incorporated and chartered banking institutions and that they are practically without Government supervision. Reference is made especially to the questionable practice indulged in by almost every bank, of permitting bank directors, without any restriction or limit, to accommodate themselves with loans of the funds of the bank over which they preside, personally adjudicating as to the value of the security they have to offer for the same. In nearly every instance where a bank has become insolvent it has been found that its directors' paper figured conspicuously among the assets, which, upon an attempt being made to realize upon it, has been found worthless.

According to the Custom-House report the imports of specie at this port during the week were \$22,000, and the exports \$756,000. Since January the imports are \$409,000, and the exports \$2,274,000. For the corresponding period last year the imports amounted to \$3,396,000. Messrs. Zimmerman & Forshay are advised of the shipment to them from Paris of \$1,250,000 francs, gold.

The new trunk lines' freight rates went into effect on Monday, according to the circular issued recently by Commissioner Fink. The new rates, subject to the authorized differentials, are as follows: From New York to Chicago—First class, 70; second class, 61; third class, 47; fourth class, 36½; fifth class, 32; sixth class, 26½. From Chicago to St. Paul and Minneapolis—First class, 30; second class, 26; third class, 20; fourth class, 14½; fifth class, 11; sixth class, 9. Intermediate points are in proportion. This is a reduction of about 20% on former rates. How long these rates will be maintained is uncertain, owing to the freight war now in progress west of Chicago. The commission feel confident, however, that the cuts will not extend to the Eastern lines.

Breadstuffs are lower. Wheat, spot stock, is lower, with rather more business for export. Corn is lower. Provisions are more active and stronger. Pork dull. Cotton, spot 1½¢ lower and dull. Coffee steady. Raw sugars are depressed. India rubber steady. Tea firm. Tobacco strong and the jobbing business fairly active.

The Pulsometer Steam Pump Company, 120 Liberty street, N. Y., have just furnished one of their No. 9 pumps, rated at 1000 gallons per minute, to the Washburn Mill Company at Minneapolis, Minn.

NEW YORK.

As yet nothing decisive has occurred in the anthracite coal regions. The rioting at Shenandoah against the going in of individual collieries at the 8% advance would seem to indicate the beginning of the end. The situation has been complicated by the decision of the men in the Wyoming and Lackawanna districts to demand an advance of 15%.

Iron Ore.—Buyers have been holding off systematically, and we understand that offers made by importers to book at current prices, and allow purchasers the full benefit of any reduction in duty which may take place, have not been tempting.

Pig Iron.—We print elsewhere our monthly blast furnace report, which clearly shows how largely the strike has curtailed production in the Schuylkill, Susquehanna, Lebanon and Lehigh districts. In the aggregate, the current capacity of Anthracite is only about 30,000 tons, as compared with 38,000 tons a month ago. The market at this point remains extremely quiet and dull. Only small sales are made from time to time at prices ranging between \$21 and \$22 for No. 1, \$19 and \$20 for No. 2, and \$16.50 and \$17 for Grey Forge. In addition to the booking of 25,000 tons some time since by the Thomas Iron Company of Pipe Irons, 15,000 tons have since been taken by another concern. It is reported that practically the entire output of the Thomas Iron Company has been applied for by consumers, subject to the announcement of prices. The latter will probably not be made until the difficulties affecting the fuel supply are finally settled.

Scotch Pig.—The market is very dull and quiet, with Summerlee and Coltness at \$21.50 @ \$22, and Dalmellington at \$19.75 @ \$20, in small lots.

Spiegeleisen.—There is no business reported, and it is likely that few foreign sales will be made for some time to come, or, at least, until the surplus of at least one of the Eastern Steel-mills is disposed of. Abroad the market has been firmer for some time past. In England the demand is reported to be good, while in Germany the syndicate is controlling prices. Importers insist that best grades of 20% foreign cannot be laid down here at a profit at under \$27.50.

Bar Iron.—We quote in carload lots on dock, 1.75¢ @ 1.80¢ for Common; 1.80¢ @ 1.90¢ for Medium, and 1.90¢ @ 1.95¢ for Refined, with half extras.

Structural Iron.—We quote Bridge Plates at 2.10¢ @ 2.20¢; Angles, 2.25¢ @ 2.40¢, and Tees 2.75¢ @ 2.90¢ in round lots on dock, and Beams and Channels at 3.3¢.

Plates.—On the basis of £9, f.o.b. English ports, foreign Steel Boiler Plates of good grades can be laid down here at a sale under 2.9¢, while Steel Tank Plate is 2.15¢ @ 2.25¢. American mills quote Flange Plates 3.15¢ @ 3.25¢, delivered, with Shell at 2.75¢ @ 2.90¢.

Steel Rails.—There is an active inquiry, and many rumors are afloat concerning large transactions. Some of them undoubtedly have no foundation in fact, and the only one which is confirmed is one lot of 10,000 tons sold by an Eastern mill for delivery at Duluth at a price equivalent to \$31.50 at mill. The sale is reported of 25,000 tons to a Northwestern road by a Western mill, which rumor had it lately was to be closed down indefinitely under arrangement with other mills. The Canadian orders, one for 9000 tons, have been placed in the East, while the other, for 7000 tons, has gone West. It is estimated by good authority that the sales up to February 1, including 60,000 to 70,000 tons carried over from last year, aggregate fully 500,000 tons. Some of the East-

ern mills, as reported, have filled their first allotment, and the indications are that they may soon apply for additional allotment. For the present, and in the near future, the bulk of the business will probably be done by Western mills. We continue to quote \$31.50 @ \$32.

Wire Rods.—So far as is known, the German Combination is holding firmly at 109½, f.o.b. Continental ports, which is equivalent to about 103½ at mill. This at 10½ freight would figure out about \$40 laid down, exclusive of interest, insurance profit or margin for risk in change of valuation at time of shipment. Some of the importers are selling small lots to consumers at figures slightly under the parity price, since they have still cheaper Rods coming to them. We quote \$41.50 nominally. The German Wire Rod syndicate has opened a sales bureau at Hagen. A German newspaper reports that it does not include the leading Silesian works, that the Hoerder Verein, the Dortmund Union, Astede, Osthaus, Eicken & Co., Gebrueder Stumm, Hamerau, Ilsenburg and other works are not in the combination. The *Eisenzeitung* contains the curious announcement that the price has been raised to 103 @ 105 marks, according to location of works, which is said to be equal to 119 marks, f.o.b. Antwerp. This price is, however, only for export to the United States. The export price for other countries is 115 marks, f.o.b. Antwerp, so that apparently the German "combine" is discriminating against consumers in this country.

Old Rails.—The market continues steady, with a report that 1500 tons have been sold at \$22. Buyers insist that the figures held by sellers are largely fictitious, and that when it comes to actual business, they can secure better terms, especially in the case of lots held at bankers.

Track Materials.—A number of round lots of Angles have been placed, including one parcel of 1300 tons to a near-by road, reported at \$1.85 delivered. A number of large orders for Spikes and Bolts have been taken. Spikes have been sold at \$2.15 delivered. A meeting of the Spike association is being held in this city to-day.

Frank E. Moffat, 100 Beekman street, has been appointed agent of the Columbia Iron and Steel Company, of Uniontown, Pa., for the sale of their Beams, Channels, Angles, Tees and special Architectural Shapes.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, PA., February 7, 1888.

Pig Iron.—The position remains as unsatisfactory as ever, and, at the moment, shows no indication of a change. Sellers find cost steadily increasing on them; prices, if changed at all, are rather less favorable than they were a week ago. At any rate it has been found impossible to secure an advance; so that the disposition now is to accept the old rates or stop production. Several furnaces will probably blow out this week, as they cannot make Iron at anything near the figures likely to be realized for it in the present condition of the market. The weakness in prices is undoubtedly due to a very serious falling off in the demand. Pig metal is not wanted in any such quantities as during 1887, so that, while there is a very material falling off in the supply, there is still sufficient for all immediate requirements, and until consumers see more business ahead they are not likely to buy much for forward delivery. Of course there is quite a possibility of some very sudden change, but, in the meantime, we can only report things as they are, and that is

absolute dullness and indifference as regards business, and, so far as we can see, without any prospect of immediate improvement. Stocks, however, are being consumed closer perhaps than ever before, and if business should take a start there would doubtless be a good deal of scrambling for Iron. This is one of the not altogether improbable contingencies, and one that consumers will perhaps not entirely ignore. Meanwhile, as we said before, consumers are absolutely indifferent to anything beyond the present, so that while there is no Iron for sale, except in small lots, there is no Iron wanted except under similar conditions. Prices remain at about \$21 @ \$21.50 at tide for No. 1 Foundry, \$19 for No. 2 and \$17 @ \$17.50 for Gray Forge. Some brands are held at a little more money, but for average qualities buyers seem able to get all the Iron they need at the quotations named.

Foreign Iron.—No business doing. There are sellers of Bessemer at about \$20 c.i.f., duty paid, or 20% Spiegel at \$28 @ \$28.50, but there is no demand of any importance.

Blooms.—There is rather more inquiry, but sales are mostly made by the home mills, on account of convenience in the matter of deliveries, &c. Quotations of foreign, c.i.f., duty paid, are about \$29.50 for Rail Blooms; \$30 @ \$31 for Nail Slabs; \$31.50 @ \$32.50 for 4 x 4 Billets, and \$35 @ \$39 for Siemens-Martin, price according to analysis, &c. Domestic Blooms as follows: Steel, from \$30 to \$35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, \$53 @ \$54; Run-out Anthracite, \$45 @ \$46; Scrap Blooms, \$38 @ \$39 per "bloom" ton.

Muck Bars.—There is not much doing, and prices are very irregular. Ordinarily \$30 at mill is asked, but some deliveries can be had at \$29.50, while others more favorably located obtain \$30.50, and for special qualities \$31 at mill has been paid.

Bar Iron.—The market is moderately active, but without any improvement in prices. Orders are chiefly for small lots, and, with the exception of a few mills that are busy on Car Iron, there is very little work on hand beyond what could be finished in course of a week or ten days' time. Under these conditions, prices are naturally weak and unsatisfactory, and, so far as can be seen at present, without any indication of early improvement. With more favorable weather an increased demand is expected, but with so many competitors for business it will require something more than ordinary to give the right tone to the market. Prices are nominally 2¢ for Best Refined Bars, but anything like good-sized orders can be placed at from 1.9¢ to 1.95¢, and for medium qualities 1.8¢ to 1.85¢. Skelp Iron is still very dull, although prices are steady at about 1.9¢ for Grooved and 2.1¢ @ 2.2¢ for Sheared.

Plate and Tank Iron.—There is a little more inquiry for Plates, and some of the mills have entered a few good orders, but there is nothing like general activity. Prospects as regards consumption are satisfactory, but the unsettled condition of affairs in the mining regions retards business so much that anything that can be postponed is postponed. Prices are irregular, and in some cases a shade lower, although no quotable change can be made at present. Ordinary rates are about as follows for small lots: Ordinary Plate, 2.15¢ @ 2.20¢; Tank, 2.30¢ @ 2.25¢; Shell, 2.5¢ @ 2.6¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.4¢ @ 2.5¢; Shell, 2.8¢; Flange, 3¢ @ 3.4¢; Fire-Box, 3¢ @ 4¢.

Structural Iron.—Some fair-sized orders have been entered during the past week, and a considerable amount more is

under consideration. The mills are fairly well employed, with a very promising outlook for the spring trade, although, for reasons previously mentioned, there is a good deal of hesitancy in coming to a formal decision in regard to some of the works. The chances are very good, nevertheless, and continued activity is believed to be pretty well assured to this class of trade. Prices remain about as follows: 2.15¢ @ 2.25¢ for Bridge Plate; 2.3¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—There is a fair demand, and for Galvanized quite a large business has been done at prices slightly above those ruling a year ago. Black Sheets show less firmness, however, particularly for large lots, although in a general way quotations are about as follows:

Best Refined, Nos. 26, 27 and 28.....	3.6¢
Best Refined, Nos. 18 to 25.....	3.4¢
Common, 1/4¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28.....	4 1/2 @ 4 1/4¢
Best Bloom Sheets, Nos. 22 to 25.....	4 @ 4 1/4¢
Best Bloom Sheets, Nos. 16 to 21.....	3 1/2 @ 3 3/4¢
Blue Annealed.....	2.8 @ 3¢
Best Bloom, Galvanized, discount.....	60 1/2¢
Common, discount.....	65 1/2¢

Steel Rails.—The market maintains a firm tone, but has not developed the activity that was expected. Sales are made in a small way at \$32 at mill, but large orders are not offered to any extent, although it is not unlikely that \$32 would be shaded for desirable orders. Mills are fairly well employed, and as at this season an increasing demand is usually met with, it seems reasonable to expect some improvement within the next two or three weeks. About 10,000 tons are under negotiation to-day at \$32 asked for delivery at mill in Eastern Pennsylvania.

Railway Supplies.—There is not much demand at present, and prices are barely steady at 2.25¢ for Spikes, 2¢ @ 2.1¢ for Fish Plates and 3¢ @ 3.10¢ for Track Bolts.

Old Rails.—The market is very unsatisfactory. There is more inquiry, and, on the whole, a firmer feeling, but it is very hard to do business at an advance. There are sellers of T's at \$22.50, afloat, and buyers at \$22, which, in the absence of actual transactions, is about the nearest quotation to be found.

Scrap Iron.—Firm and in good demand. Sales readily made at about the following quotations: No. 1 Scrap, \$21 @ \$21.50; carload lots, \$22 @ \$22.50, or for choice lots \$22.50 @ \$23; No. 2 do., \$14 @ \$15; Turnings, \$15 @ \$16; Old Car-Wheels, \$17.50 @ \$18; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$16 @ \$17; do. Borings, \$11 @ \$12; Old Fish Plates, \$26 @ \$27; Old Car-Wheels, from \$18 to \$19, delivered.

Wrought-Iron Pipe.—The mills in this locality are doing a fair amount of work, considering that this is usually the dullest month of the year. The strike in the Western mills will throw some trade in this direction which will prove quite acceptable, especially so at this season. Prices are weak and unsatisfactory, discounts being quoted as follows: Black Butt-Welded 50%; on Galvanized do., 42 1/2%; on Black Lap-Welded, 62 1/2%; on Galvanized do., 50%; Boiler Tubes, 57 1/2%.

Nails.—There is some improvement noticeable in the general situation, a fair demand prevails, and prices show a hardening tendency, and are quoted at from \$2.10 to \$2.15. The association hold their meeting at the Continental Hotel, this city, on the 9th inst., and the impression prevails that the list will be advanced to \$2.25. Manufacturers claim that there should be no difficulty attending this movement, as at the figures now ruling there is no encouragement for them to push trade.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., Chicago, February 6, 1888.

A lively trade is anticipated between this city and points west of it in consequence of the reduction in railroad freight rates which was established the latter part of last week. On some classes of goods, such as Nails, Bar Iron, &c., the cut has been more than half. Inquiries are coming in very fast to-day, and those who are in shape to make immediate shipments of goods are masters of the situation, as the railroad war is not expected to be of long duration, although rates cannot be advanced until ten days' notice has been given, under the provisions of the Interstate Commerce act.

Pig Iron.—Trade continues in about the same condition as outlined in our last report, the demand running to high numbers rather than to regular grades. The scarcity of Old Car-Wheels causes buyers to look sharply after lots of Nos. 4, 5 and 6 of Lake Superior Charcoal Pig, and the scarcity of ordinary Cast Scrap causes a corresponding demand for No. 3 Foundry and Mill grades of Coke Pig. The volume of business is not so great as it has been, but there is still a fair trade in progress. Prices are firm for Charcoal Iron, particularly of standard brands, but Coke Iron is somewhat affected by reports of sales of Ohio Iron at low figures by parties in need of money. The manufacturers of Coke Irons for which this is a natural market are unable to meet the low prices referred to, and will make no attempt to do so while they are running on Ore bought at last season's rates and having high freight charges on Coke and Pig. Good orders are in sight for Charcoal Pig, and the foundries are so full of work that a better demand for Coke Pig seems also to be assured in the near future. Southern Coke Pig is again less plentiful, and prices are not so low as they were a week or two since. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$22; Nos. 4, 5 and 6, \$21.50; Alabama Car-Wheel, \$26; Southern Charcoal Foundry, \$20.50 @ \$21.50; Jackson County Softeners, No. 1, \$20.50 @ \$21; Hocking Valley, Soft Foundry, No. 1, \$20 @ \$20.50; Hocking Valley, guaranteed Silicon, No. 1, \$21; American Scotch, No. 1, \$20.50 @ \$21.50; Lake Superior Coke, all Ore, No. 1, \$20 @ \$21; No. 2, \$19 @ \$20; No. 3, \$17.50; Cinder Mixed, 50¢ less; Coke Bessemer, run of furnace, \$20 @ \$21; Southern Coke, No. 2, \$19.50 @ \$20; No. 2 1/2, \$18.75 @ \$19.25; No. 3, \$18.50; No. 1 Mill, \$18; No. 2 Mill, \$17.50.

Bar Iron.—The quantity of actual business placed during the past week was lighter than usual, but inquiries are numerous and the outlook is more encouraging. Prices are a little stronger than they were, although mill orders are still being taken on a basis of 1.75¢, half extras, for Common, f.o.b. Chicago, with some sellers asking 1.80¢. Muck Bar Iron, in mill lots, sells at 1.90¢ @ 2¢, according to quality and specifications. Store prices are quoted at 2¢ @ 2.2¢, but these prices are being shaded to best buyers.

Structural Iron.—The market is not very active, and prices are drooping. Mill orders, f.o.b. Chicago, are quoted as follows: Angles, 2.35¢ @ 2.40¢; Tees, 2.75¢; Universal Plates, 2.50¢; Beams and Channels, 3.4¢. Store prices are 1¢ @ 1¢ higher than these rates.

Plates.—A few good orders have been placed during the week, but trade generally has been quiet. Mill prices are weak, but store prices are firmly maintained, as follows: Heavy Sheets, Nos. 10 to 14, 2.80¢; Tank Iron, 2.75¢; Tank Steel, 3¢; Shell Iron, 3.25¢; Shell Steel, 3.50¢;

Flange, 4¢; Fire-Box, 4.75¢. Boiler Tubes are weaker, and are now quoted at 55 % @ 57 1/2 % off, according to quantity.

Sheet Iron.—A few mill orders have been taken for Black Sheets at 2.9¢ at mill for Nos. 26 and 27, and there is a fair demand for Galvanized. Jobbers quote 3.50¢ for No. 27 Black, 60¢ off for Juniata Galvanized, and 6 % and 5 % off for Charcoal, with concessions for quantity.

Merchant Steel.—Manufacturers' agents report a good demand for mill shipments, but not up to the standard for this time of the year. Store trade is quiet. Quotations are as follows: Bessemer Bars, 2.35¢ @ 2.50¢; Tool Steel, 8 1/2¢ @ 9 1/2¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.25¢; Open-Hearth Spring, 3.30¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

Steel Rails.—The starting up of the South Chicago works of the North Chicago Rolling Mill Company, which took place this morning, is an indication of an improved state of affairs in the Rail trade. Both of the Steel plants of this company are now running, but the Union and the Joliet will not start their works for some time. All these companies have taken orders during the past week aggregating in the vicinity of 50,000 tons. Quotations range from \$34.50 to \$35, according to quantity.

Old Rails and Wheels.—No sales of Old Iron Rails have transpired during the week, but \$22 @ \$23 is still asked by holders. Old Car-Wheels have also been without movement, but \$21 is offered by a large consumer.

Scrap.—The demand seems to be improving, as inquiries are becoming more frequent, and same sales have been made at our quotations. Dealers offer \$14 @ \$15 for Mixed Country Scrap. Selling quotations for carefully selected are as follows, per ton of 2000 lb: Railroad Shop or No. 1 Forge, \$21 @ \$22; Track, \$19 @ 20; Mill Iron or No. 1 Wrought, \$16; Light Wrought, \$9.50 @ \$10.50; Machinery Cast, \$16; Stove Plate, \$12 @ \$13; Cast Borings, \$10 @ \$10.25; Wrought Turnings, \$12.75; Axle Turnings, \$14.50; Coil Steel, \$15; Leaf Steel, \$16; Locomotive Tires, \$17 @ \$18; Mixed Steel Scrap, \$12; Horseshoes, \$19.50 @ \$20; Axles, \$26.

Nails.—Manufacturers' agents report a quiet week, but the sudden reduction in freight rates to Missouri river points is expected to stimulate the demand very sharply. Prices have been slightly irregular, owing to manufacturers quoting to retail dealers, thereby competing directly with the jobbers. Small lots of Steel Cut Nails are quoted at \$2.20, and Wire Nails at \$2.90, with 10¢ off for carloads.

Barb Wire.—Further concessions have been made by jobbers during the past week and the greater part of the advance recently agreed upon by the manufacturers has been lost. The lowest price now quoted on carloads is, however, believed to be 3.10¢ for Painted and 3.15¢ @ 3.25¢ for smaller lots, according to quantity. Galvanized commands the usual 4¢ advance. Orders are coming in more freely, but the volume of business is not very large.

General Hardware.—The demand for reasonable goods is excellent and increasing every day, causing the outlook to become more and more encouraging. The condition of prices is about the same as reported last week, concessions being made on some goods, while others are firmly held, and rates have even been advanced. Square and Hexagon Nuts have been marked up to 4 1/2¢ @ 5¢ off the standard list, and all Carriage Hardware is stiffening. The Heavy Hardware trade has been very good for the past 10 days, orders for Wagon

Work and Carriage Goods being specially large. Collections are very fair.

The report that the Calumet Iron and Steel Company, of Chicago, are having trouble over nailers' wages is incorrect. There was a little discussion between the managers of the company and some of their workmen on that point, but it was speedily settled, and the works are running full in every department and with perfect harmony between all parties.

Charles W. Davenport, manufacturers' agent for Iron and Steel Boiler Plates, Tank and Sheet Iron and Steel Boiler Tubes, Structural Shapes and Bars, has reopened his office in Jones & Laughlin's building, 26 West Lake street, Chicago. He will act as selling agent for several of the largest Eastern and Western mills.

The office of Clifford J. Ellis, manager of the Chicago branch of the Cambria Iron Company and the Gautier Steel Department, removed on February 1 from the Montauk Block to Room 209 Phoenix Building, southwest corner of Clark and Jackson streets, opposite the Grand Pacific Hotel.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue, PITTSBURGH, PA., February 7, 1888.

The general Iron trade continues in an unsettled and unsatisfactory condition, and while in some respects the outlook is unfavorable, the general belief is that an improvement is near at hand. River navigation has again been resumed, and there is reason to believe that it will not be suspended again this winter. Considerable Coal will be got out from here within the next day or two, although the down-river markets are overstocked and buyers here are holding off, buying only as their immediate necessities require, in expectation of lower prices. At Cincinnati, where in December there was a Coal famine, and consumers were paying famine prices, 20¢ @ 25¢ per bushel, there is a good stock afloat and but little doing. Some of our Pittsburgh operators, who got considerable Coal there on the recent freshets, have not sold a bushel of it as yet. It is intimated that the large operators are largely responsible for the very unsatisfactory condition of the market there and at other points, the object being to squeeze the smaller operators out of the business. The freight rates from Chicago Southwest are lower than they have been for several years, and our manufacturers will, as far as possible, take advantage of the same. Agents of the Southwestern lines in this city report shipments as being large since the cut in rates. The latest rates from Chicago to Kansas City, St. Joseph, Leavenworth, Council Bluffs and Omaha are as follows, with Iron in the sixth class: First class, 37 1/2¢, per 100 lb; second class, 30¢; third class, 24¢; fifth class, 14¢; A, 17 1/2¢; B, 16¢; C, 15¢; D, 15¢. The rates from East St. Louis are: First class, 17 1/2¢; second class, 10¢; third class, 14¢; fourth class, 14¢; fifth class, 9¢; A, 6 1/2¢; B, 8 1/2¢; C, 10¢; and D, 10¢. The rates may be lowered still more, or shippers are liable to be notified at any time of an advance. The Chicago, Burlington and Quincy Railroad, it appears, is determined to meet the rates of those roads outside of the pool.

Pig Iron.—There is no improvement to note in the situation, and while it is hoped that there soon will be, the outlook in some respects is not as encouraging as it might be. The market at present is in a most unsatisfactory condition so far as the producer is concerned, as there is no margin for profit at present prices. It is very evident there will have to be a radical change in the situation soon; the cost of production must be reduced, or the price

of Pig Iron advanced, otherwise furnace-men will have to blow out, as it is not to be expected that they will continue to work away as matters are at present. It is expected, however, that they will be able before long to reduce the cost of production somewhat; a further reduction in the price of Coke is probable, and then it is thought a cut of about 10 % in the cost of labor will be obtained. Some furnace-men are refusing to accept present prices, but consumers appear to have no trouble in obtaining all they want for present use at rates quoted, and they do not seem over anxious about contracting ahead. Furnace-men in the Shenango and Mahoning valleys have sold but little Iron in this market of late. Southern Iron has been shut out from here ever since the Interstate Commerce law went into effect, and Eastern furnace-men are obtaining a better price at home than can be obtained here. Still, as already stated, consumers are able to get about all Iron they want within the range of prices quoted. Some well-informed operators incline to the belief that, with an improved demand, there will be an advance in price; that in that event home furnaces will not be able to meet the wants of consumers, and furnace-men at a distance will then as now refuse to accept present prices. Prices remain unchanged. Sales standard brands of Neutral Gray Forge at \$16.25 @ \$16.50, cash, although the latter is regarded as an outside price. We quote as follows:

Neutral Gray Forge.....	\$16.50 @ \$17.00, 4 mos.
All Ore Mill.....	17.50 @ 18.00 "
White and Mottled.....	16.50 @ 17.00 "
No. 1 Foundry.....	18.50 @ 19.00 "
No. 2 Foundry.....	17.50 @ 18.00 "
No. 1 All-Ore Foundry.....	19.25 @ 19.50 "
Charcoal Foundry.....	23.00 @ 25.00 "
Cold Blast Charcoal.....	27.00 @ 30.00 "
Bessemer Iron.....	18.00 @ 18.50 "

So far as we can learn *there have been no sales below \$17.75, cash.

Muck Bar.—Continues dull; no change in price, which we continue to quote at \$28 @ \$28.50, cash. A good many of the mills can make more Muck than they need, and are on the market to sell; hence a further decline is not impossible before long, although it is admitted that there is no bonanza in it at present prices.

Manufactured Iron.—Trade is generally reported slow, but it is hoped and expected that orders will soon commence to come forward more freely, as is usually the case at this season of the year, when the spring trade opens up. But few of the mills are working up to their full capacity. While there is a good deal of misgiving in regard to the future, for which various reasons are assigned, it is the opinion of well-informed operators that the present season will be equal to that of 1887. Prices may be quoted upon a basis of 1.80¢ @ 1.90¢ for Bars, 60 days, 2 % off for cash. In addition to the regular Merchant trade, the indications are that there will be a good demand for specialties.

Nails.—The Nail trade continues much the same. Manufacturers continue to report trade very dull, but they are hopeful of an improvement within the next few weeks, although the outlook is not particularly promising. Prices remain unchanged at \$2, 60 days, 2 % off for cash, with the usual discount of 10¢ per keg on carload lots and upward. So far as we can learn, there is no cutting on the rates quoted, and there is not much room to cut, as the rates quoted are very close and afford little or no margin for profit.

Rough-Iron Pipe.—Orders continue scarce, and there is not likely to be any substantial improvement until March or April. It is not likely that there will be many new mills started up this year, as the Pipe-making capacity has been overdone in the past year or two. Discounts on Black Butt-Welded Pipe, 50 %; on Galvan-

ized do., 42½%; on Black Lap-Welded, 62½%; on Galvanized do., 50%; Boiler Tubes, 57½%; Casing, all sizes, 55%; 2-inch Tubing, 18¢ per foot; 2-inch Line-Pipe, 12¢.

Old Rails.—The market for Old Iron Rails continues in an unsettled condition; notwithstanding efforts of certain New Yorkers to create a boom, the Western consumers thus far have not responded thereto. A couple of weeks ago a report was sent out from New York of a sale of 2000 tons of Double Heads on Pittsburgh account at \$23 there; it now transpires that instead of being 2000 it was 200 tons, and the cost, delivered in Pittsburgh, was \$26. We are advised of some sales of American Tees at \$24.25, and it is intimated that they can be bought at \$24.

Steel Rails.—Heavy Sections are still quoted at \$32.50 @ \$33, cash, on cars, in Pittsburgh.

Billets, &c.—Bessemer Steel Billets are still quoted at \$29 @ \$30, and Nail Slabs at \$29 @ \$29.50. Sale of 200 tons reported at \$29.50. Sale of Foreign Billets reported at \$33.50, delivered in Pittsburgh. American Wire Rods quoted at \$44 @ \$45, on cars, in Pittsburgh. Rail Ends dull; quoted at \$19 @ \$19.25 and Bloom Ends about 50¢ per ton less.

Railway Track Supplies.—An improved demand is looked for soon; no change in prices. Splice-Bars, 1.90¢ @ 2¢; Track Bolts, 3¢ with square and 3.10¢ with hexagon nuts.

Old Material.—Of all kinds is reported dull, but there is no important change recently in prices. No. 1 (Railroad) Wrought Scrap, \$20 per net ton; Wrought Turnings, \$14; Car Axles, \$26 @ \$27; Cast Scrap, \$16.50 @ \$17, gross; Cast Borings, \$12 @ \$13, gross. There appears to be no demand for Old Car-Wheels, and in the absence of sales we omit quotations.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts.,
CHATTANOOGA, TENN., February 6, 1888.

Interviews with some of our largest wholesale dealers of Hardware and Heavy Goods develop the fact that their trade for January of this year has exceeded in volume their trade for the corresponding winter of last year by 5 to 15%, and from 20 to 50% of the same month for the year previous. When it is remembered that a large number of new stores have been started during the past year, probably nearly as many as were in existence before, it must be evident that the volume of business now being done at this place exceeds that of 1886 by at least 200 to 300%, and there appears to be nothing in sight that would indicate in the near future any falling off in the continued growth and increase of general business. There is an enterprise that has been talked of for some time and much written about which seems now to be taking shape more effectually than ever before, and that is an establishment to be located in the city or in the immediate vicinity for making gas to supply fuel to the manufacturers that are in and about the city. Those who are in it, and some of them are men of large means, are estimating that they can supply fuel at a cost not to exceed that of coal for the same purpose, and upon which there will be a large margin of profit, besides which there will be considerable profit in the by-products.

Pig Iron.—There is nothing new to note in this article. Our furnaces are having no trouble nor concern in disposing of all they make. In fact, a large majority of it has already been sold for the present year, and what is left unsold there is a large local demand for, which absorbs a large portion of it. The consumption of Pig through the South is largely on the

increase, and for the present year will probably be double what it was last year. Until some better arrangement is made for the Coke supply in the South the new furnaces that are being erected, of which quite a number will be completed this year, will not cut much of a figure in supplying the country with Pig Iron. Prices of all desirable grades remain the same, and the demand is fully up to the supply, while much more could be sold if producers would be willing to take less than the current figures. There has been quite an inquiry from the East for Foundry grades, and some contracts have lately been made for small round lots to go to that section. Some of these inquiries are for large amounts, but the furnaces that still have much Iron to spare are quite reticent when the question of large lots is mentioned. The sales that are now being made generally range from 100 to 500 ton lots for near delivery, and sales for large lots are now an exception.

Cleveland.

CLEVELAND, February 6, 1888.

Iron Ore.—Mine owners and dealers have been stirred up by the report that the Pennsylvania Company have placed an order for 30,000 tons of Steel Rails at \$31.50 per ton—the first indication of activity in the Rail market, so far as Western mills are concerned. Sales of Ore are still held in abeyance, and even negotiations between the furnace men and dealers are denied. Oremen are gratified over the action of the railways leading from the mines to the upper lake ports in reducing the carrying prices 10¢ per ton. This action will surely affect vessel rates, and overtures from the vessel owners are expected this week. If the other railways, following the Pennsylvania's example, immediately begin purchasing Steel Rails in liberal quantities and at such figures as \$31.50 or \$32, the Ore dealers may ask the vessel men for their freight schedule and prepare to dispose of the season's output of Ore. But there will be no sales until the Oremen have obtained satisfactory conditional or engaged charters. This is the situation and it will remain unchanged until the vesselmen present a reasonable card of rates for the season. The assertions of the owners of lake vessels that low water will necessitate smaller loading and that in consequence full rates are justified does not count for much. Low water in the winter is not an unusual feature of the five great lakes. The streams are frozen solidly, and the fields are covered with snow. In the early spring the lakes will in all probability resume their natural level. The report of the astonishing fall in water was wired from Cleveland originally as a bit of sensational news which investigation shows to have been exaggerated. The vesselmen seized upon the report, and have advanced it as a potent reason for their entirely unreasonable demands for freight. A few hundred tons of Ore, sold during last season, are arriving by rail, and about 24,000 tons have been shipped from the docks to the furnaces during the past week. Last season's quotations still prevail.

Bar Iron.—The lively buying movement of the past week has not increased quotations beyond \$1.75 @ \$1.80. Two dealers have, however, in anticipation of a better market, refused to book orders at these figures.

Pig Iron.—The market is weak, and there is scarcely any buying or selling. One firm has sold about 2000 tons of No. 1 Bessemer at private terms, supposed, however, to be about \$20.85. The selling of raw material at sacrifice quotations is believed to be responsible for the present lethargy. When the millmen regain their confidence in the market and are willing

to purchase largely and for future delivery, the market will resume its normal tone. Lake Superior Charcoals have been asked for gingerly, and the few sales that have occurred were on the basis of \$21.50 @ \$23 for all numbers of this brand of Iron.

Wire Nails.—A meeting of manufacturers of Wire Nails was held in this city on Thursday for the purpose of forming an association for mutual protection. It was announced that the association would embrace the whole country. At the close of the very brief session it was stated that nothing had been accomplished.

The Britton Iron and Steel Works, burned on Saturday, will be rebuilt at once. The management places the loss at from \$35,000 to \$40,000.

The Hill Clutch Works, of this city, have opened a branch office at 28 South Canal street, Chicago.

The Western Mineral Wool Company's works in this city, recently almost destroyed by fire, have resumed operations.

Louisville.

LOUISVILLE, KY., February 6, 1888.

Pig Iron.—The market has continued quiet. Parties who were expecting higher prices owing to the strike in the East and the heavy sales made in the South during the past six weeks have hardly had their expectations realized. The market holds its own, and buyers are making purchases for immediate delivery. For some brands there is difficulty in obtaining what is desired for prompt shipment, and we have known of parties buying small lots for 50¢ a ton more money than offers have been made to them for long deliveries, within the last two weeks. Buyers do not consider that there has been any improvement in prices and are not certain that bottom has been reached. In looking over the purchases for the last ten years of Charcoal Irons made by a buyer in this vicinity, we made the discovery that Charcoal Mill Iron had been sold in this market for as low a price as at any time since 1878. We hardly think Charcoal Irons will be bought lower as there has not been the increase of these furnaces that has been witnessed in Coke. Old Rails and Wheels are selling on a basis of \$22 for Old Rails and \$19.75 for Old Wheels.

Southern Coke, No. 1 Foundry	\$18.50 @ \$19.50
" No. 2 "	17.50 @ 18.50
" No. 2½ "	17.00 @ 18.00
Hanging Rock, Coke, No. 1 Foundry	19.00 @ 20.00
Hanging Rock, Charcoal, No. 1 Foundry	22.50 @ 24.00
Southern Charcoal, No. 1 Foundry	19.50 @ 21.50
Silver Gray, different grades	16.00 @ 17.00
Southern Coke, No. 1 Mill, Neutral	16.00 @ 17.00
" No. 2 "	15.50 @ 16.50
" No. 1 " Cold Short	15.50 @ 16.50
White and Mottled, different grades	15.00 @ 16.00
Southern Car-Wheel, standard brands	23.00 @ 24.00
Southern Car-Wheel other brands	20.00 @ 21.00
Hanging Rock, Cold Blast	24.00 @ 25.00
Hanging Rock, Warm Blast	20.00 @ 21.00

Coal Market.

The market for Anthracite Coal is dull and irregular, for, while certain sizes adapted to manufacturing are in demand and very scarce, readily commanding the highest prices, others, like Broken, Egg and Stove, are in good supply and easy. The news that the miners' strike and railroad strike have both received the approval of the Executive Committee of the Knights of Labor, also that 15% advanced wages in the Wyoming region would be demanded, has had as yet no effect further than to prolong the period of uncertainty. Buyers and sellers alike are in consequence too timid to enter into important engagements. Some small dealers are scared, one of this class having paid for Coal \$5.15 alongside, equal to \$4.90 f.o.b. Current quotations are about as follows: Free Burning White Ash Stove,

\$5, alongside; Chestnut, \$4.75, f.o.b.; Pea, \$3.50, f.o.b., and has sold as high as \$4, alongside. Broken is not as scarce as a week ago. Lehigh and Wilkesbarre are quoted f.o.b. net as follows: Broken, \$4.15; Egg, \$4.30; Stove, \$4.75; Chestnut, \$4.75.

Bituminous Coal is unchanged at \$3.50 alongside. Shipments from the Cumberland region last week were 52,000 tons and for the year 249,300 tons, an increase of 65,000 tons compared with 1886.

The Anthracite Coal receipts for the week are decidedly larger, affording substantial evidence that impediments to the trade are gradually giving way, the total from the three mining districts being 568,717 tons, an increase of 121,300 tons compared with the previous week, of which the Wyoming mines furnish the extraordinary amount of 489,388 tons, or 100,000 tons more than in the stormy week preceding, and Lehigh increased in quota 17,000 tons, the Schuylkill district remaining as before, 25,000 tons. Three weeks compare as follows:

	Tons.
Week ending January 21.....	555,517
Week ending January 28.....	447,464
Week ending February 4.....	568,767

Unless forcibly interrupted the New York receipts for the current week will show a more important gain, from the fact that the Wilkesbarre operators have been notified to ship no more to Philadelphia for the present on account of the crowded condition of the North Pennsylvania tracks east of Bethlehem. Since January 1 the total output is 2,747,786 tons, as compared with 2,869,580 tons for the same time in 1887.

The miners' strike has entered upon a new phase this week from the circumstance that it has been formally ordered by the Executive Board of the Knights of Labor, thus directly antagonizing the Reading Railroad Company. The gauntlet is thrown down, and it remains to be seen how the miners will respond. The Coal operators are steadfast in the belief that the Wyoming laborers who have good wages and no grievance—who have made no complaint—will disregard any orders to come out. In any case, the leaders of the strike believe there will be no lack of funds to sustain those who refuse to work and say they expect to win. The Reading Coal and Iron Company claim that they have 11 collieries at work. In at least two instances conflicts have occurred between the miners and the police, but with less serious consequences than there was reason to apprehend.

Metal Market.

Copper.—The London market was ill sustained immediately after our last week's report, which closed with the quotation of £77 for Chili Bars. It gave way to £75. 5/ on Thursday, but recovered to £75. 7/ on Friday, with sales of 375 tons. In our own markets the speculative dealings were tame, the turn over on 'Change during the latter half of last week not exceeding 2,000,000 lb all told, spot at 16 3/4, February at 16.55/ March at 16.65/ @ 16.75/ and April at 16.85/. March and April were firm, because those operating for a rise calculate that consumers will about that time be compelled to replenish supplies, and that the free export we have had lately will cause a scarcity. The January returns of output of mineral from Lake Superior mines show the product to have been: Calumet and Hecla, 1802 tons; Tamarack, 630; Atlantic, 229; Osceola, 210; Franklin, 177, and Huron 110. The total product of the seven leading mines is in another dispatch given as 3510 tons of mineral, against 3207 in December. Mineral is about 76% fine. This week opened without much spirit and lower, but a slight recovery took place upon a

2/6 advance being cabled from London, where Chili Bars improved to £75. 10/, with sales of 450 tons. Sales on Monday were restricted to 275,000 lb, at 16.60/ for February and 16.80/ for April. The boom in Copper shares has been kept up in Paris last week, Rio Tinto advancing 35 francs.

The following cable dispatch was received from Spain: "A strike and riot at the Rio Tinto mines took such proportions that it had to be quelled by soldiers, leading to some loss of life; the English company, against which the strike was directed, finally yielded to the demands made." Yesterday London advanced 20/, to £76. 10/, with sales of 575 tons; and although this improvement coincided with the burning of the Calumet and Hecla's No. 8 Hecla shaft house, it had no effect on our market. The shaft house in question is in that part of the mine which is now being worked—viz., in the Black Hills ground. We understand that No. 8 is a new shaft, and is not one of the shafts through which active hoisting of stamp rock is going on. So far as can be learned, the accident will not interfere with the present rate of output. Ammonia is now being pumped into the burning mine, and local newspapers dated the 2d report a reduction of temperature of 15° to 20°. To-day (Thursday) the market is tame, and in the afternoon was lower, with sales of spot from 16.45/ down to 16.38/, February at 16.40/, March 16.50/ and June 16.60/.

Operators connected with the Cotton Exchange are the principal bears, being short of April Copper. This morning's cable is £76. 12/6 for Chili Bars and £79 for Best Selected. We reprint elsewhere a number of interesting statements from English newspapers bearing on the situation abroad. Briefly the syndicate appears to control the Rio Tinto, the Seville and Mason & Barry in Spain, the Tharsis doubtful, the Panuncillo and others in Chili, and the Namaqua, Cape of Good Hope. In this country they have control of the Tamarack on the lake, the Boston and Montana, in Montana, the latter for 18 months, guaranteed by a leading banking firm here. They have bought the Anaconda output for this year. In Arizona they seem to have the Arizona Copper Company. In the aggregate the output of this mine for 1888 is estimated at 95,000,000 lb. Manufacturers in this country have not as yet bought. Casting Copper is quoted 15.25/ @ 15.50/, with little doing.

Lead.—This market has been excited by news from the other side of the Atlantic that a syndicate had been formed there to take over the product of the Spanish, French and German mines at £16, for two years, sharing an advance above that figure with the producers. During the week, sales aggregating about 1500 have been made up to 4.90/ @ 4.95/, and there is a speculative element which appears to give credence to the reports in question. Consumers are acting conservatively and are incredulous, and in their behalf it may be stated that with our present heavy production our market may be regarded as practically independent of foreign operations, since we do not import nor export Lead of any consequence. On the other hand, consumers are known to have little stock, and with the active season approaching it is possible that the leading operator here, who is known to carry considerable Lead, may succeed in maintaining an advance under the pretext stated.—*Exchange.* Cables make Spanish Lead £15 and English £15. 5/, so that the advance thus far has not amounted to more than a trifle. Our own cable advices report a decline.

Tin.—Dealing have been chiefly in March Tin, which declined from 35.10/ on Thursday last to 34.50/ on Saturday,

recovering again to 34.70/ on Tuesday, while April sold on the same day at 33.50/ down to 33.35/. At the close 36.60/ is bid for spot; 37.25/ is asked for prompt shipment; 36.65/ bid and 37/ asked for February; 34.50/ and 35/ for March, with sales at 34.75/ and 33.20/ bid, and 34/ asked for April. *Tin Plates.*—The essential features of the Tin Plate market are practically the same as they were a week ago, and the changes in prices are insignificant. The canners are doing considerable buying, and Cokes are moderately firm in consequence. Stocks in New York are very light, neither are supplies plentiful anywhere in this country. At the close of last week the Baltimore market was so bare that large buyers there had to send to New York and Philadelphia for Plates, paying full prices and cost of transportation. Abroad the market for near-by deliveries is strong, but futures are a shade easier. We quote large lots in New York as follows: Siemens-Martin Steel, Charcoal finish, \$5.20 @ \$5.30, ditto Coke finish, \$5; Ternes, \$4.30 @ \$4.50; Bessemer Coke, \$4.80 @ \$4.85, and Wasters, \$4.65.

Spelter.—The market is quiet and dull, at 5¢ for Common Domestic, and 5.75¢ for Sheet Zinc in round lots. Abroad Spelter is easier.

Antimony.—We quote 11¢ @ 11 1/2 for Hallett's, and 14¢ @ 14 1/2 for Cookson's.

New York Metal Exchange.

The following sales are reported:

THURSDAY, February 2.

25,000 lb Copper, February.....	16.55¢
16 tons Lead, spot.....	4.77 1/2¢
25,000 lb Copper, spot.....	16.50¢
25,000 lb Copper, February.....	16.55¢
180,000 lb Copper, March.....	16.6¢
50,000 lb Copper, May.....	16.7¢
32 tons Lead, March.....	4.75¢
48 tons Speier, February.....	5.83 1/2¢
100 tons Tin, March.....	35.10¢
50 tons Lead, March.....	4.75¢
16 tons Lead, March.....	4.75¢
225,000 lb Copper, spot.....	16.50¢

FRIDAY, February 3.

10 tons Tin, March.....	35.10¢
10 tons Tin, April.....	39.85¢
75,000 lb Copper, April.....	16.55¢
16 tons Lead, February.....	4.70¢
16 tons Lead, March.....	4.70¢
16 tons Lead, March.....	4.67 1/2¢
15,000 lb Copper, April.....	16.85¢
25,000 lb Copper, June.....	16.70¢
100,000 lb Copper, February.....	16.55¢
150,000 lb Copper, March.....	16.75¢

SATURDAY, February 4.

10 tons Tin, March.....	34.55¢
10 tons Tin, March.....	34.50¢
75,000 lb Copper, February.....	16.60¢
25,000 lb Copper, March.....	16.70¢
25,000 lb Copper, May.....	16.75¢
16 tons Lead, February.....	4.70¢
16 tons Lead, February.....	4.67 1/2¢

MONDAY, February 6.

32 tons Lead, February.....	4.80¢
16 tons Lead, March.....	4.85¢
100,000 lb Copper, February.....	16.60¢
16 tons Lead, March.....	4.90¢
50,000 lb Copper, April.....	16.80¢
25,000 lb Copper, February.....	16.60¢

TUESDAY, February 7.

10 tons Tin, March.....	34.80¢
55,000 lb Copper, April.....	16.85¢
100,000 lb Copper, April.....	16.80¢
50,000 lb Copper, April.....	16.85¢
16 tons Lead, April.....	4.92 1/2¢
100 tons Lead, April.....	4.95¢
50,000 lb Copper, March.....	16.74¢
10 tons Tin, April.....	33.50¢
10 tons Tin, March.....	34.65¢
10 tons Tin, March.....	34.70¢
10 tons Tin, April.....	33.50¢
10 tons Tin, April.....	33.45¢
10 tons Tin, April.....	33.35¢
10 tons Tin, April.....	33.35¢
100,000 lb Copper, February.....	16.60¢
25,000 lb Copper, April.....	16.80¢

WEDNESDAY, February 8.

25,000 lb Lake Copper, March.....	16.65¢
125,000 lb Lake Copper, June.....	16.60¢
25,000 lb Lake Copper, spot.....	16.45¢
25,000 lb Lake Copper, spot.....	16.35¢
25,000 lb Lake Copper, spot.....	16.40¢
50,000 lb Lake Copper, February.....	16.45¢
30,000 lb Lake Copper, February.....	16.40¢
50,000 lb Lake Copper, March.....	16.60¢
100,000 lb Lake Copper, March.....	16.55¢
25,000 lb Lake Copper, March.....	16.50¢
50,000 lb Lake Copper, spot.....	16.30¢
10 tons Tin, March.....	34.70¢
10 tons Tin, March.....	34.75¢
10 tons Tin, April.....	33.45¢
10 tons Tin, April.....	33.35¢
10 tons Tin, April.....	33.35¢
100,000 lb Copper, February.....	16.60¢
25,000 lb Copper, April.....	16.80¢

Detroit.

CHARLES HIMROD & Co., dealers in Iron, Detroit, Mich., report, under date of February 6, 1888, as follows: For Charcoal Iron, particularly that made in the Lake Superior district, there has been a very active demand at full prices for Car-Wheel purposes during the past week, and large quantities of Iron must have been sold, and this puts the theorists figuring that much more Iron is being consumed than is made and that the market should advance at once, as stocks are very small. Lake Superior is by far the strongest grade of Iron in this part of the country to-day. The placing of orders by some of the Eastern roads for Steel Rails has temporarily checked the decline in Northern Coke Irons, which are firmer, and the prospects for the Bessemer output are brighter to-day than they have been any time this year. Southern Irons, for round lots and prompt delivery, seem very hard to get, and no change has been made in prices. The demand seems to be general, and it is not any particular class of buyers who are placing their orders, but both small and large consumers are seeking for Iron. It is hoped that within the present week Ore rates will be established on some kind of a basis which will allow figuring for the future. We quote the market as follows:

Lake Superior Charcoal, all numbers	\$2.00 @ \$23.00
Lake Superior Coke, All Ore	21.25 @ 21.75
Lake Superior Coke, Cinder Mixed	19.00 @ 20.00
Standard Ohio Blackband	21.50 @ 22.00
Southern No. 2	19.50 @ 20.00
Southern Sliver	18.50 @ 19.00
Jackson County, Ohio, Sliver	20.50 @ 21.00
American Old Iron Rails	25.00 @ 26.00
Old Wheels	21.00 @ 22.00

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	1/2 lb. \$0.10 @ \$0.12
Light Copper	1/2 lb. .06 @ .09
Copper Bottoms	1/2 lb. .06 @ .09
Brass, Heavy	1/2 lb. .08 @ .09
Brass, Light	1/2 lb. .06 @ .07
Composition	1/2 lb. .12 @ .12
Lead, Heavy	1/2 lb. .03 @ .04
Tea Lead	1/2 lb. .04 @ .04
Zinc	1/2 lb. .08 @ .09
Wrought Iron	1/2 ton, 18.00 @ .00
Light Iron	1/2 ton, 10.00 @ .00
Stove Plate Iron	1/2 ton, 10.00 @ .00
Machinery Iron	1/2 ton, 13.00 @ 13.50
Grate Bars	1/2 ton .00 @ 7.00
Old Rubber	1/2 lb. .04 @ .05
White No. 1	1/2 lb. .08 @ .09
White No. 2	1/2 lb. .01 @ .01
Canvas, Linen, No. 1	1/2 lb. .04 @ .04
Canvas, Cotton, No. 1	1/2 lb. .04 @ .04
Canvas, No. 2	1/2 lb. .02 @ .02
Seconds	1/2 lb. .01 @ .01
Soft Woolens	1/2 lb. .06 @ .07
Mixed Rags	1/2 lb. .01 @ .01
Gunny Bagging, No. 1	1/2 lb. .02 @ .02
Jute Butt	1/2 lb. .02 @ .02
Book Stock	1/2 lb. .00 @ .01
Newspapers	1/2 lb. .00 @ .01
Waste Paper	1/2 lb. .00 @ .01
Hemp Twine	1/2 lb. .02 @ .02
Sisal Baling Rope	1/2 lb. .02 @ .02

Paints.

Black, Lamp—Coach Painters	1/2 lb. 22 @ 24¢
" Ordinary	.8¢
Black, Ivory Drop, fair	12 @ 15¢
" best	29¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best	40 @ 55¢
" in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	15¢
" Van Dyke	10 @ 12¢
Dryers, Patent American	ass'd cans, 9¢; kegs, 7¢
Green, Chrome	15 @ 23¢
Green, Chrome in oil	14 @ 18 @ 25¢
Green, Paris	good, 20¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron, ant. Bright Red	1/2 lb. 21¢
Iron Paint, Brown	1/2 lb. 13¢
Iron Paint, Purple	1/2 lb. 13¢
Iron Paint, Ground in oil, Bright Red	1/2 lb. 54¢
Iron Paint, Ground in oil, Red	1/2 lb. 54¢
Iron Paint, Ground in oil, Brown	1/2 lb. 54¢
Iron Paint, Ground, Purple	1/2 lb. 6¢
Litharge	6¢
Mineral Paints	2 @ 4¢
Orange Mineral	.10¢
Red Lead, American	61¢
Red Venetian (Eng.) dry	\$1.65 @ \$1.70
Red Venetian in oil	ass'd cans, 11¢; kegs, 8¢
Red Indian Dry	9 @ 12¢
Rose Pink	10 @ 13¢
Sienna, American Raw, powdered	.4¢
Sienna, Burnt, powdered	.4¢
Sienna, Burnt, in oil	10 @ 18 @ 20¢
Sienna, Raw	11 @ 15 @ 25¢

Umber, Burnt, powdered	4 @ 8¢
Umber, Burnt, in oil	9 @ 12 @ 15¢
Umber, Raw, powdered	4 @ 7 1/2¢
Umber, Raw, in oil	9 @ 12 @ 15¢
Vermillion, Chinese	.90¢
Vermillion, English	70 @ 71¢
Vermillion, American Common	.15¢
White Lead, American pure dry	.6¢
White Lead, American pure dry, in oil	7 @ 7 1/2¢
White Paris, English Prime	.2 @ 2¢
Yellow Ocher, French	\$1.75
" asst'd cans, 11¢ : kegs, 8¢	
Yellow Ocher, Vermont	.in casks, 11¢
Yellow Chrome	.17 @ 27¢
Yellow Chrome, in oil	14 @ 18 @ 25¢
Zinc White, American No. 1, dry	.5 @ 6¢
Zinc White, American No. 1, in oil	.9¢
Zinc White, French (Paris Dry)	67¢ @ 73¢
Zinc White, French, in oil	10 @ 11¢

A correspondent makes several inquiries regarding steel castings on which we would be glad to have some light thrown. Whatever experience any of our readers may have in connection with the matter would, no doubt, be of general interest. Our correspondent asks: Can you inform me if steel castings have been used in any place where they are subject to a test similar to that to which the crown sheet of a shell is exposed under forced draft? Also can you tell me what is the best thickness to make steel castings so that they will be fully annealed? Finally, what should you consider best—steel castings or malleable iron for a place similar to the one referred to above?

Every one, says the *American Architect*, has seen some of the wide planks of redwood which occasionally appear in the Eastern markets, but few persons outside of California know the gigantic dimensions in which redwood lumber may easily be obtained from mills which possess machinery capable of sawing it. We remember seeing once a solid redwood plank 5 feet wide, which was the admiration of the building portion of the town for a time; but, according to the *California Architect*, this was small compared with some to be had in the vicinity of the redwood forests. Not long ago the managers of a State fair in California sent circulars to the saw-mills, inviting exhibits of redwood planks. In response to this a certain mill sent a "good-sized" plank, which measured 6 feet in width. Hearing of this, the proprietors of another mill worked up some planks 80 inches wide, and sent samples for exhibition; and soon afterward a third establishment, the McKay mill, forwarded a lot of perfectly clear, sound planks and boards, varying in width from 10 to 11 feet. If there were any special demand for such enormous pieces of this unrivaled timber, they would be more frequently seen, but the wood construction of the world has for a thousand years been based on the assumption that sawed sticks measuring more than 12 inches in breadth or depth of section would be costly, and difficult to obtain; and a new system must be made to suit the materials of the Pacific Coast, or the redwood logs will continue to be subdivided into pieces approaching in size the Eastern lumber. On the other side of the water, the standard of size for framing timber is still smaller than with us. If we are not mistaken, few mediaeval cathedrals on the Continent contain a stick larger than 8 inches square in cross-section, and although English timber was of larger dimensions a thousand years ago, there would be little difference now.

A decree from the French Minister of Commerce secures a victory of the iron-makers over the ironworkers in the question of the temporary admission of metal for re-export after manufacture. Hitherto, since 1862, workers of iron were allowed to discharge their bond by the exportation of a quantity of iron equivalent to that they had obtained authorization to import. In reality they usually sold the certificate, or *acquit à caution*, and manufacturers in

the center of France were able to save the cost of bringing the material from the frontier. Iron-makers have long protested against that system, and demanded that the iron exported should be identically the same as that imported. They have now obtained satisfaction by a decree dividing iron into two classes, for the purposes of temporary importation, or foundry pig, for which the old system will be maintained, and mill iron or Bessemer used for the manufacture of steel, which will, after six months has been allowed for present contracts to be terminated, be subject to the régime of the identical, and will have to be accompanied by a customs officer to the place where it is to undergo transformation. As those works are in the center of France, at Le Creuzot, for example, the cost of transport will prevent manufacturers from exercising the privilege of working up foreign iron, which is what the French makers desire.

A remarkable engineering feat has just been carried out in China in the face of unusual physical obstacles. This was the stretching of a steel cable of seven strands across the Luan River by Mr. A. de Linde, a Danish civil engineer, aided only by unskilled Chinese labor. The cable is strung from two points 4648 feet apart. The height of one support is 447 feet above the present level of the river, and the second support 737 feet above it. The vertex over the water is 78 feet. The Chinese cable is the longest but one in the world. The telegraph air cable across the Kistna has a span of 5070 feet; two similar cables across the Ganges, one 2900 and the other 2830 feet. A third line of 1135 feet crosses the Hooghly, and in the United States there is one over the Missouri of 2000 feet.—*Indian Engineering*.

The New England Weston Electric Light Company, of Boston, Mass., have fitted up an ordinary street railroad car on the Cambridge Division of the West End Street Railroad, of Boston, with a motor built by the United States Electric Lighting Company, of New York, and employ 120 cells of the Julien storage battery. The car will be given a thorough trial.

In view of the march of naval affairs it is certain that the torpedo boat is retiring from the high position it has held in public estimation.

The January statistics of the New York Building Department show that there is a temporary check in building operations. The number of new structures proposed was 117, at an estimated cost of \$1,945,000, which is a reduction of something like one-third, compared with January, 1887, and a heavy falling off when contrasted with either 1886 or 1883, but is much better than the unfavorable record of 1884. The number of conveyances in January was unusually large, representing over \$17,000,000, but the mortgage incumbrance was upward of \$10,500,000, showing a very moderate equity. The indications are that building last year was overdone.

The outlook for the glass trade in Pittsburgh for 1888 is very promising. There are about 50 factories engaged in the business and there are two firms which each do about \$250,000 per annum.

The model for the colossal figure of William Penn, to adorn the clock tower of the new City Hall in Philadelphia, is being prepared. The figure will be nearly 40 feet high, and will weigh, when finished, over 30 tons, in bronze. The legs are 20 feet long and the Quaker hat-brim measures 22 feet around its edge.

General Hardware.

The past week has been uneventful, with very few changes in prices and no material change in the volume of the demand for Hardware. A fair trade is reported by the jobbing houses, the manufacturers being for the most part well occupied on orders. The severe weather which has prevailed has doubtless had a depressing influence on business, but the prosperous condition of the country at large and the prospects for a fine trade in the near future are regarded with satisfaction.

NAILS.

The New York market continues quiet and dull, with little pressing and generally a steadier feeling. We quote for small lots from store \$2 for Iron Nails.

WIRE NAILS.

There is no change in the market price for large lots, \$2.60 being regarded as about the regular quotation for carload lots from factory. In this market, however, lower prices are being made for small lots from store, and \$2.70 to \$2.80 may be regarded as a fair quotation.

Purchasers of Wire Nails are complaining of short weight in the kegs furnished by some manufacturers. The shortage is reported to run from 2 to 8 pounds per keg, being usually 2 to 3 pounds, or enough to cover at least 5 cents, enabling the sellers to quote that much below their competitors. The condition of the Wire Nail trade has become very unsatisfactory to the manufacturers, on account of the extremely low prices which have recently been quoted, and it is now claimed that base sizes are being sold below cost, but it is intimated that some of the manufacturers are endeavoring to make up part of the loss by giving short weight. This dishonest practice can not be too severely condemned, but it will undoubtedly correct itself, as purchasers will naturally avoid further dealings with any found guilty of such a departure from commercial rectitude.

Reports are also coming in in regard to the deteriorating quality of the Nails, complaint being made that material of an inferior grade is used, with considerable carelessness in the manufacture, so that it will be well for the trade to be careful to secure goods of an approved quality as well as full weight.

BARB WIRE.

There has been considerable buying on the part of jobbers and dealers in anticipation of the spring, and the low quotations of two works selling in this market have been withdrawn. We quote for large lots of Four-Point Galvanized Barb Wire, 3.9¢ @ 4¢.

A meeting of the Barb-Wire manufacturers is to be held on the 15th and 16th inst. at St. Louis, to consider the situation as affected by the Shiras decision, and discuss proposed schemes for a consolidation of interests.

MISCELLANEOUS PRICES.

The Screw market continues without further change except that resulting from the gradual disposal of stocks purchased at the low prices. The extra discounts to which we have had occasion frequently to refer are consequently given less freely and frequently by the jobbers, many of whom are, however, selling to the retail trade at the manufacturers' present extreme prices. On the other hand, many of them are replenishing their stocks at the present prices, and the manufacturers refer to the indications as pointing to a satisfactory trade the coming season. That they have adhered to their prices during the past few months, in which their sales were compara-

tively limited, is an indication of the satisfactory working of the agreement which exists between them.

W. & J. Tiebout, 16 and 18 Chambers street, New York, have advanced their Cast Brass Butts, making the discount 33½ per cent. instead of 40 per cent., as heretofore.

Logan & Strobridge, New Brighton, Pa., have issued their revised price list of Coffee Mills and a circular relating to it, in which they quote discount 50 per cent., 60 days, or 2 per cent. off for cash.

The Cronk Hanger Company, Elmira, N. Y., quote the following prices on their Carrier Anti-Friction Hanger, the list prices given being subject to a discount of 50 and 10 per cent.:

	Per Doz. Pr.
No. 4, 5-foot run.....	\$15.00
No. 5, 10-foot run.....	18.00
No. 6, 15-foot run.....	21.00
Steel Rail, per foot, 10 cents.	

ITEMS.

Hoopes & Townsend, Philadelphia, have issued a convenient collection of the association lists of Nuts and Washers, as recently revised, with lists of extra sizes, superseding those printed in their catalogue of 1883. The issuing of these sheets in this form is stated to be a temporary expedient, a new and revised catalogue of their products being in preparation for publication on or about March 1.

The Standard Company, 129 Portland street, Boston, issue circulars relating to their Duplex and Rival Beaters, which are illustrated with full-sized cuts. They call attention to the low price at which these goods are selling, and refer especially to their Duplex Beater, alluding particularly to the patent improvements by means of which the floats are made fast to the pinion with an eyelet, and the gear handle and frame substantially riveted together so that they cannot come apart.

The New Haven Staple Works, New Haven, Conn., issue in convenient form an illustrated card of Staples. It contains full-sized cuts of the Staples from $\frac{1}{4}$ inch to $4\frac{1}{2}$ inches, with the size and list price printed in red. Four samples of Staples, each showing a different style of finish, are attached where they belong, a method which has the advantage of enabling the merchant to show the various sizes and the different finishes without trouble. This is an arrangement the convenience of which, we think, will be appreciated by the trade.

The sales headquarters of the National Tube Works Company, of McKeesport, Pa., for the Western Pennsylvania and Middle District, heretofore located at the general office, at McKeesport, has been transferred to its branch office at Pittsburgh, to which all mail matter for the middle district will in the future be directed. The headquarters of the assistant general manager, Mr. E. C. Converse, have been transferred to the branch office of the company at New York City, from which point Mr. Converse will direct the management of the sales department of the company.

O. Lindemann & Co., 81 Beekman street, New York, have issued their 1888 catalogue of Bird Cages, which represents a large variety of these goods, Japanned, Brass, Tinned, Wire, Silver-Plated and Wood. It also shows a line of Bird-Cage Supplies and specialties, all of which are illustrated.

The Peters Cartridge Company, Cincinnati, Ohio, issue a circular relating to the Peters Cartridges, and giving information in regard to the Peters Patent Cartridge Loading Machine, of which they have the control in this country, and of the Peters Patent Indentations for securing the load if the shell. They also issue a price list in the Peters Cartridges, which are made

in a variety of numbers in 10 and 12 gauge.

Clarence Dickinson, 90 Potter Building, New York, agent for the Cleveland Rolling Mill Company, is sending out paper-cutters, one side of which is occupied by the Wire list and a calendar for 1888 and the other being marked in inches as a rule and calling attention to the company's manufactures.

Silver & Co., New York, in consequence of fire in their building, on the 15th ult., have removed temporarily to the adjoining building, 58 Warren street. They state that they have a stock of most of their specialties at their Newark factory, so that they are in a position to fill orders with their usual promptness.

The copartnership of Pratt & Co., Elmira, N. Y., has been dissolved, C. F. Carrier deeding his interest to D. R. Pratt. The business will be continued under the same name with D. T. Pratt as manager, and Geo. E. May, late of the Binghamton Hardware Company, as buyer.

The Sault Ste. Marie News, Sault Ste. Marie, Mich., in a recent issue giving a description of the city's jubilee, gives a number of portraits of the leading business men, among which is that of P. M. Church, the well-known Hardware merchant.

The Ames Plow Company, Quincy Hall, Boston, and 53 Beekman street, New York, whose factories are at Worcester and Ayer, Mass., issue a convenient pamphlet devoted to the illustration of their farming implements and machines. Beginning as it does with plows and ending with weather vanes, and representing a large line of leading implements and machines, it will be of interest to the trade.

The Manly Mfg. Company, R. P. Manly, president, Dalton, Ga., issue a circular in which they state that they have in preparation a new catalogue, and alluding to the advantages of their new location. They state that they will add to former production in steel and iron those of wood in combination. They also solicit inquiries, and will be pleased to enter on their records the names of those who desire their further publications.

Announcement is made at Cape Girardeau, Mo., January 30, that the partnership heretofore existing between Edward S. Lilly and Leo Doyle under the firm name of Edward S. Lilly & Co., has been dissolved, the dissolution taking effect from January 1. Edward S. Lilly succeeds the old firm, and will carry on the business.

A recent issue of the Decatur County Journal, Leon, Iowa, refers to the firm of Farquhar Bros., who recently succeeded Sam Farquhar, whose business was established in 1861. The extent of their trade and enterprise are alluded to.

The trade will observe by their advertisement on page 55 that Chas. J. Healy & Co., 26 Warren street, New York, besides their brand of Bridgeport Knife Company's Cutlery, allude to the fact that they are representatives of the New American File Company, Hobart, Craig & Co., Geo. Manby & Co. and other manufacturers, prominent mention being made of Healy's Sheffield Razors and American Gun Locks.

H. W. Hill & Co., Decatur, Ill., issue in their unique and striking style circulars relating to their line of Hog Rings and Ringers for the coming season.

The trade will be interested in page 84, which is devoted by Peabody & Parks, Troy, N. Y., to the illustration of their Royal Dauber, giving also a long list of jobbing houses throughout the country who are selling it. It is interesting to note that the Dauber is having a steadily increasing sale and seems to be giving universal satisfaction.

The Clark Mfg. Company, Buffalo, N. Y., issue a circular in which they inform the trade that the use of their name, Clark's, in connection with the manufacture and sale of Window Blind Hinges, Gate Hinges, Window Pulleys and other articles of their make by any other parties is unauthorized.

A. H. Whiting, successor to Whiting & Co., 468 and 470 Cherry street, New York, is putting on the market a new line of Sap Buckets, to which we shall have occasion to refer in a later issue.

Greene, Tweed & Co., 83 Chambers street, New York, are now in the market as manufacturers of Augers and Bits. On this line of goods there is no change in the situation, the tendency having been of late toward greater uniformity in price on the rather low level made some time ago by some of the manufacturers.

Kelley, Maus & Co., jobbers of Heavy Hardware, Wagon and Carriage Stock, &c., corner of Lake street and Fifth avenue, Chicago, have completed their organization under the charter of incorporation recently granted them. They retain the old firm name. The officers of the company are as follows: David Kelley, president; F. K. Maus, vice-president; C. B. Kelley, treasurer; A. D. Kelley, secretary. The capital of the company is \$400,000, all paid in.

The Bryan Mfg. Company, Byran, Ohio, issue on separate sheets of excellent paper well-printed descriptions of their leading Wheelbarrows. Among these they allude to the Abdallah Park Stable Wheelbarrow as new, and as meeting a need which has long existed.

The trade will observe the special notice on page 46 in which a well-known Hardware house, under the *nom de plume* of "Northwestern," intimate their desire for one or two partners with \$100,000 capital, that they may be able the more effectively to occupy their enlarging market. We may add that the house is one of recognized position, and the opportunity would seem to be deserving the attention of those who desire to engage in such an enterprise.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., have issued a price current relating to a varied line of seasonable goods, and in it many styles, owing to the compact and effective arrangement of the 44 pages devoted to them, are illustrated. The front cover contains an attractive illustration in which a variety of Tools and Implements are tastefully and effectively grouped. The last page is devoted to Binding Twine, a special reference being made to the excellent quality of that sold by them last year, and the intimation made that they have contracted for the best quality for the coming season.

The Pennsylvania Wire Works, Edward Darby & Sons, Philadelphia, issue a circular relating to their Wire Work and specialties, in which they give full sized cuts of Spark Wire Cloth for coal burning locomotives, to which the circular especially relates. Miners' Safety Lamps are also represented.

The Francis Axe Company, Buffalo, N. Y., have now issued their catalogue, which represents their well-known line of Axes, among which their All Steel All Polished Axes are referred to as a specialty. It also represents George Washington Hatchets Bench Axes, &c., and Picks, Mattocks and Grub Hoes.

Chas. P. Holdrege, Bloomington, Ill., representing the Simmons Hardware Company, sends out a postal containing a list of some of their leading lines, with a blank for the date of his expected calls upon his customers.

R. Armiger & Son, Baltimore, Md., have issued their catalogue for the present year. It appears that they have made numerous

changes in their styles, and have added some new patterns. Their list now embraces over 120 different and distinct numbers. They allude to the improvement they have made in their Climax Refrigerators, which are now finished in handsome ornamental cases. In response to the numerous inquiries for Hardwood Refrigerators they can now furnish their Climax in solid ash and walnut cases, handsomely finished. The catalogue is attractively printed, with unique cover representing the grain of wood, the name and address of the manufacturer being effectively placed on a block of ice.

W. H. Jacobus, 90 Chambers street, New York, sends out a card calling attention to and illustrating the Acme Self-Acting Gasoline Torch, manufactured by W. P. Pope, 254 Bridge street, Brooklyn, N. Y.

The Chieftain Hay Rake Company, Canton, Ohio, issue a small pamphlet devoted especially to their principal lines of Post-Hole Diggers—the Hercules, the Scheidler and the New Champion. It represents Hay Forks, Tree Protectors and Step-Ladders.

The Wells & Nellegar Company, Chicago, Ill., issue price current relating to Metals, Axes, Steel Goods, Sporting Goods and a variety of specialties, while it also mentions some of the leading lines which they are handling. In their introductory remarks they refer to the purchase of the stock and good will of the late firm of Keith, Benham & Dezendorf, and state that they have consolidated the same into their Lake street store, where they are prepared to offer as large a line of goods as any house in the West.

Paine, Diehl & Co., Philadelphia, issue a 30-page pamphlet with tasty and artistic front and back cover. It is entitled "Uses for Eggs," and is intended to be of service for those using their Egg Beaters, and gives a large number of recipes. Some of their other household utensils are also illustrated.

TRADE TOPICS.

The following communication from William J. Ladd, 37 Chambers street, New York, who is well known as proficient in the science of discounts and author of Ladd's Discount Book, will be of general interest to our readers:

To the Editor of The Iron Age.—The item below is from the New York Sun of February 5:

How can I make a price list subject to 35 per cent. discount? For instance, exact cost of goods, \$2.81; profit, \$1; selling price, \$3.81. What per cent must I add to this so that by deducting 35 per cent. the result will be \$3.81?

M.
Add 35 per cent., to be sure. That will be \$1.33, so that you will mark your goods \$5.14.—*New York Sun.*

If the New York Sun had gone a little further and proved the figures it would have been discovered that by that way of figuring "M" would lose 47 cents. No, you should not "Add 35 per cent., to be sure," as the Sun has it, but 54 per cent. Go at it in the right way as follows: Divide 35 per cent. by the other part of 100 (65), and you have 53.84 (call it 54) as the percentage to add, and the list price would be \$5.86 instead of \$5.14. Of course this rule applies to any percentage: having found the percentage to add upon \$1, an intelligent use of Ladd's Discount Book will save all further computation.

Among the letters received from Hardware merchants is one from Maine, in which the writer suggests an improvement which, in his opinion, might be adopted by manufacturers much to the convenience of merchants:

Among the many suggestions made in *The Iron Age* for the proper conduct of the Hardware business, I have not yet seen stress laid upon one point that seems to me of considerable importance, and that is the neglect of man-

ufacturers to place numbers upon each article of their manufacture to correspond with the numbers in their catalogue. It is not enough for the convenience of the retailer that the box in which the goods are placed be numbered: the figures should be upon each article. The chief sinner against my convenience which I have in mind is—in their line of Iron Planes. There are so many kinds of these goods that when several nearly alike are shown at one time, it is sometimes puzzling to know into which box to return them. It would be so easy to cast the figures upon the frame of each of the Tools that it seems surprising it never has been done.

TACKS.

We have received from a number of Hardware merchants in different parts of the country letters in regard to their opinion of the feasibility and desirability of marking Tacks, as suggested by J. F. Harris of the Auburn Tack Company, Auburn, N. Y., with the exact amount of goods in each paper, his suggestion also being that the designation of Tacks by ounces should be discontinued and corresponding numbers substituted. This latter point, has, however, been overlooked by most of our correspondents, whose letters relate to the question as to whether each paper of Tacks should state the weight or number of Tacks contained in it. The letters from which extracts are taken are all from representative wholesale and retail Hardware houses, and in addition to indicating the opinion of the trade on this subject, they will be of interest as illustrating the different ways in which the subject may be regarded.

I have no complaint to make against the present system of putting up Tacks.

In our judgment this would be no real advantage to the retail trade. The present system seems to be satisfactory to our customers.

In our opinion it would be much better to state the exact weight on the label and thereby protect both the dealer and the purchaser. We have a Cheap John establishment in town that advertises three papers 8-ounce Tacks for 5 cents. Of course they are only quarter weights. We are selling one paper that contains 4 ounces for 5 cents, and while it contains one-fourth more Tacks than the other, yet people often think one package as large as the other. This statement you will easily see is misleading, and not only demoralizes legitimate trade but deceives purchasers. We believe that labeling all the packages would to a great extent cure this defect.

We are of the opinion that the placing of the weight on each package of Tacks would be of decided advantage to the retailer, as it would enable the customer to see where he got the most for his money. We find the tendency is to put off light-weight goods at full-weight price, and think this would obviate the trouble.

We believe there would be a decided advantage to the trade in making a complete change in the system of putting up Tacks from the present system of counts, which has led to so much petty fraud, to a system of weights by which it could be readily determined whether the package contained what it actually represented or not. Under the present system the inconvenience of counting Tacks to determine whether the buyer is being swindled or not gives the seller practical immunity from result of fraudulent practices. If, instead of this, makers should abandon entirely the system of counts and adopt weights as their basis, marking each package as you suggest, a very vexed question with jobbers as to whether they handle docked weights or lose trade in such an important line should be solved.

We think the exact weight printed on the labels would be an excellent idea, as, in our opinion, it would help the honest manufacturers and dealers who want to give their customers full value for their money.

We would prefer to have all Tacks put up full weights and the exact amount printed on wrapper.

In our opinion, if the actual weight was marked upon each package of Tacks it would prove very satisfactory to the honest retailer. The retail trade in Tacks is working largely on to bulk goods, for the reason that the square dealer likes to give 16 ounces to the pound.

In our opinion the method of putting up Tacks suggested by Mr. Harris would be a great improvement over the old way for Cut Tacks; but we think that Carpet Tacks (tinned) should be in papers, put up by actual count,

100, 150, or 200 Tacks in a paper. Then you know just what you are getting and you can inform your customer just what he is buying, and if he buys a paper of Tacks for 5 cents and it has only 75 Tacks in it, and subsequently gets one containing 150 Tacks for the same money, he will determine where to buy the third package when he needs it. In this age of competition, when so many ways of fraud are resorted to, actual count is the only honest system, and we buy Carpet Tacks no other way.

We, and probably every dealer, feel the necessity of some plain and convenient way by which shortage in the weight of Tacks may be easily detected. We think the suggestion of J. F. Harris a good one, and if adopted would prove a source of convenience to dealers and an annoyance to short-weight factories.

My opinion is that the old system of designating Tacks is quite satisfactory. I think that dealers fully understand what is meant by half weight or full weight, and manufacturers putting up short-weight goods will become unpopular in the Tack business the same as in any other business. Frequent changing of lists, &c., confuses the dealer and often is far from an improvement, as, for example, the new Leather Belt list as compared with the old.

In our opinion the present method of putting up and labeling Tacks is the best, if manufacturers would put up quarter and half weights instead of cutting them short.

I think the plan proposed by Mr. Harris would be received with favor by the trade, and I should be glad to see it tried. My experience with short-count Tacks has been unpleasant. Anything to remedy this difficulty—which has existed only in Carpet Tacks—would be appreciated by jobbers, retailers and consumers.

We do not think there would be any advantage to any one in the change proposed by Mr. Harris. The present system is perfectly satisfactory.

We approve of the plan suggested by Mr. Harris in *The Iron Age*, January 26. There would be less fault finding by the customer and more satisfaction to the retailer.

We think Mr. J. F. Harris's plan for putting up Tacks is first class, and that it would be appreciated by the trade. We should certainly prefer it to the old way and think it would please our customers.

In our opinion there would be no advantage to the retailer in labeling each paper of Tacks with the number of Tacks contained in it. Small consumers seem to be indifferent as to the number of Tacks in a paper. If packages are too small they buy more than one paper. This applies of course more particularly to Carpet Tacks. Consumers who buy any considerable quantity of Tacks know what they want as to number in package, &c. Carpet Tacks, as they are now sold, afford good profit to retailer, and there are very few Hardware lines that do. Nearly all Tack makers claim to put up honest count packages. Retailers as a rule know what they want and where to buy. If there is any advantage in putting up Tacks in nicely labeled packages and in straight and uniform weights we think the Stanley Works, New Britain, Conn., should head the list as to amount of sales. Their plan is a good one. The class number on each paper indicates number of Tacks in paper, and the dealer can ascertain weight in paper by referring to the catalogue.

We think Mr. Harris's plan would be of great advantage to the trade. Certainly it would give the consumer better satisfaction to know what he is getting, as about one-half of them kick about buying Tacks in papers.

In regard to Tacks we say, let the Tacks fill the package, no matter how large or small the package may be. We dislike to serve a customer with a package large enough to hold twice the quantity of Tacks actually contained therein. If the people should vote on the question no doubt they would vote for uniformity.

I think the plan suggested by Mr. Harris is a good one. Although dealers should know the proper weight, many do not. I think the plan would do away with the cut weights, as it would call the attention of both the retailer and consumer to the weight, when tests would follow and honesty be enforced.

If the retailer exercises proper care in his purchases, looking carefully to the interests of his customers, this matter would adjust itself. I do not favor the many changes inflicted on the dealer. If dealers would stand straight the manufacturers would have to be honest or go to the wall. When I buy I always make it thoroughly understood that goods are to be as purchased or they go back. I never compromise, and in this way I generally get what I want.

I have read with much interest the plan proposed by Mr. Harris in your issue of January 26, and it impressed me at once as being a good

suggestion. I think the trade understand and suppose straight goods to mean 8 ounces full weight and 4 ounces half weight in 8-ounce size Tacks. In many places Tacks are purchased in bulk and weighed out to the consumer. This custom must be a great annoyance to the trade, especially when very small quantities are called for. This practice could be done away with by putting Tacks in papers with actual weight marked on each package. I mean by this the actual weight of the Tacks and paper package together. I am decidedly in favor of Mr. Harris's plan, and think it both desirable and feasible.

We can see no advantage to the trade in having each package of Tacks marked with exact weight, as per letter of J. F. Harris in this week's *Iron Age*.

We think it would be an advantage to have each package of Tacks marked with exact weight.

We have read Mr. Harris's letter in last week's *Iron Age*, and fully concur with him in regard to printing the exact weight on each package of Tacks. We think it would be a decided advantage to all merchants and honest manufacturers. We have noticed an increased demand in our trade for bulk goods, which leads us to the conclusion that our customers prefer to buy Tacks by weight and know what they are getting. If they were put up and numbered as Mr. Harris suggests we think it would obviate the necessity of keeping many sizes in bulk.

I think it better not to interfere with the present manner of putting up Tacks. Something should be done to break up the irregularity in weight of Tacks. A manufacturer or jobber who is inclined to give his customer the value of his money has to meet prices of some one who is selling less bulk for less money, and the majority of the trade do not take the trouble to investigate and find out whose prices are the cheapest, but take it for granted that an 8-ounce Carpet Tack is all that is necessary to buy, regardless of the quantity the package contains. We know of no other staple article in the Hardware line where the quantity is not as represented. Manufacturers of Screws could as well make 11 dozen a gross; Bolts 45 or 95 to the package; Copper Rivets and Burrs, 14 ounces to the pound, &c. But let any manufacturer undertake to deceive the trade in this way and how long could he hold his trade! He would receive more ventilation than he would get in a Dakota blizzard! But Tacks seem to be an exception. Manufacturers can put up 3 ounces or 7 ounces in a package and label it 4 ounces or 8 ounces, and it is all right. Why is it so? There is but one answer, and that is that either the manufacturer or dealer, or both, want to cheat by giving short weight, or by offering a lower price make their customers think they are selling cheaper than the person who is selling honest-weight goods. We know honest-weight goods will sell and bring what they are worth where the customer knows what he is getting. The enormous sale of "Honest Count" and similar brands is proof that dealers and consumers appreciate just weight in Tacks as well as any other article of merchandise. We can see no objections to numbering Tacks as suggested by Mr. Harris, and surely no confusion would be caused by the change, even if customers would order so many of a certain ounce Tack the order would be understood. We think the weight should be on each package, and then those who want to buy $\frac{1}{2}$ -pound papers will know what they are getting and their customers will also know when they are getting what they pay for. We hope some plan will be adopted that will do away with the "big box and no Tack" business.

We are in favor of the package of Tacks showing on the label exactly what it is. We do not think it advisable to change the old classification, but half-weight should be half-weight and full-weight full-weight. We think also that Tacks of different sizes in 1-pound papers will be called for in the future. We believe in the adoption of safeguards as a preventive of fraud in the manufacture of goods.

In regard to the present manner of putting up Tacks I would say I think it would be of great advantage to the trade to have Tacks marked with their contents, as the present method is misleading, and unscrupulous manufacturers have reduced the number of Tacks in a paper that they may make lower prices than their more honest competitors.

We approve of Mr. Harris's plan of having exact weight and length stated on each package of Tacks, but think this change would be followed by a tendency to make Tacks of a given length "stouter" than the old standard sizes. In other words, with a given weight and given length the number of Tacks in a package might vary greatly on account of the "wire" or gauge size of the Tacks. We would, therefore, suggest as an additional feature that there

should be printed on each package a number or other mark to indicate whether the Tacks are slim, stout or over-stout.

We are opposed to changes on principle. There are too many changes in the trade lists, which are a constant source of error and confusion. As every one understands the present system of labeling Tacks we are at a loss to offer any reason for a change.

I would say, by all means have the exact weight of Tacks stated on each paper. This, of course, would not prevent a manufacturer putting up short weight, but it would enable any ordinary man to find it out.

We like Mr. Harris's idea and hope it will be adopted by the manufacturers. It would save a great amount of correspondence with customers not familiar with the present method of putting up Tacks.

I see no advantage in having packages of Tacks labeled with exact weight. There is not one customer in a hundred that ever knows the lengths or sizes, let alone the weight. "A paper of Tacks is a paper of Tacks to retail customers." I purchase in quarters, halves and wholes and sell accordingly.

In the first place, and it covers nearly all the ground, manufacturers cannot put up short weights if jobbers and dealers refuse to handle the goods. That remedy above all others seems to me better than the proposed change. If I weigh a dozen quarter weight 8-ounce Tacks and they do not show 24 ounces, I do not want nor will I have the goods. After weighing three packages of three different makers on my shelves I found each one to weigh full 24 ounces, which is proof conclusive that honest, reliable goods are made. The plan proposed is not feasible, because of its complication. Neither is it desirable because of the long established and very satisfactory terms of designation now in use. Again, the opportunity for shortening weights would be just as open under the proposed change as it now is. After carefully looking over the matter I feel as a retailer that we want no change that is not for the better, and the proposed one certainly is not.

In our opinion every package of Tacks should have the exact weight stamped on the outside of the package.

We have read Mr. Harris's letter and cannot see any advantage in the proposed change. We have sold A. Field & Sons' goods almost exclusively for 24 years. The quality is always good and we have tested the weight several times for different reasons and always found it full and regular.

The present system of designating Tacks is satisfactory to us. As regards weight would say we are satisfied as they now are. When we buy short weights we expect to buy them cheaper than full. Most Tacks sold in a retail way are sold by the single paper and for 5 cents, and the consumer is more generally satisfied with the quantity he gets, the retailer making a good profit.

I think it would be a very good idea to have the exact weight of the packages branded on them. I object to the short weights and there should be something done to remedy the same. I do not think the idea presented by J. F. Harris, Jr., in regard to putting them up in 1-pound, $\frac{1}{2}$ -pound and $\frac{1}{4}$ -pound packages is just the thing, as this calls for much larger packages than are always wanted, as many times in buying small sizes the consumer does not want more than 5 cents' worth. I think it would be well for the manufacturers to adopt a certain weight for the packages and put them up in a form to retail at, say, 5 cents, 10 cents and so on up, with amount in each package branded on same.

We would much prefer that each package should be marked so as to indicate its contents, kind, amount, &c. To sell Tacks in bulk is a great bother. But a short weight is an abomination. Mr. Harris's plan seems to cover the ground.

We would much prefer to have them put up in quarter and half weights and so labeled ounce sizes. Also think it would be better to red label the quarter weight and green label the half weight, or vice versa. The cost to the manufacturer would not be increased. The weight and ounce might be marked:

1 doz.	{ Quarter weight 2-ounce paper	{ 8 oz.
1 doz.	{ Half weight 4-ounce paper	{ 8 oz.

The trade and country merchants then know just what they are getting and the consumer is not cheated. We have seen quarter weight packages, giving the country merchant the idea that Tacks could be bought cheaper from A than from B, though B's quarter weight was full quarter, while A's dozen contained about 240 Tacks to the dozen. This applies to short weights. In the last few years Tacks have

done more to make a crow think he is white than anything else. We want guaranteed full quarter and full half weights.

We believe that Tacks should be put up in full weight papers and that each package should be labeled with the exact amount it contains. The public have already learned that Tacks put up in papers contain more vacant space than Tacks, and insist on having them in bulk. This is a nuisance to any dealer, and if people could get value received in papers we believe it would be a great advantage to the trade in several ways.

This is a question worthy of discussion and large retail and wholesale dealers and manufacturers ought to exchange their views. We will only suggest a few changes and think they would suit nearly all; namely, put up Cut and Carpet Tacks in 1-ounce, 2-ounce, 4-ounce, &c., papers, indicating this on label, and designate size, not, as at present, by 4 or 6-ounce Tacks but give length same as in the case of Brads; that is, 4-ounce, $\frac{1}{2}$ Cut Tacks, which would be the same as half weight 8-ounce. We should like this way, stating length and weight of each. A retailer's customer often asks for Tacks $\frac{1}{2}$ or $\frac{1}{4}$ -inch long, and nine times out of ten the dealer must open two or three packages to get the correct size.

We have become familiar with the system and it fully meets our approval. Doubt if anything better could be devised.

Putting Tacks in exact weight packages would be better for the consumer, and no doubt better for all concerned. At the same time the present system, which has been so long in use seems to be satisfactory.

A leading tack company, writing with reference to the suggestion made in our last issue in regard to an improved method of designating and marking Tacks, writes as follows:

In regard to the plan suggested by the correspondent in last week's paper, I do not believe it to be at all feasible, and even if it were the manufacturers would be slow to adopt it, and matters would be mixed worse than they are now.

In the following letter, from a well-known Tack manufacturer, it will be seen that the new Tack list is alluded to, as well as one of the discouragements in the way of manufacturers who put up honest weights:

We do not think that the new Tack list will serve any further purpose in the trade than to bring goods to a more fairly horizontal price, from which a more uniform discount may be named covering all classes. The dealer, in his anxiety to get lower prices, does not as a rule, stop to consider anything beyond his own profit, and most generally discounts his own prospects by combining with irresponsible, or very smart, manufacturers of his own class of the genus homo. The writer has met buyers of very "honorable" and wealthy houses in the past 60 days, who said that they did not care what the goods were like, or whether they weighed more or less, if they could sell them at a good profit. This is discouraging, at least to old-time conservative manufacturers.

SARGENT & CO.,

New York and New Haven, Conn., are issuing their discount sheet No. 9, which applies to their catalogue of 1884. The discount sheet bears date January 5, many of the prices having gone into effect at that time. We print below the portion of it which relates to goods of their own manufacture. Cases in which there has been a change in the list are indicated by an asterisk (*). In addition to the prices named below there is the usual extra discount of 10 per cent. for prompt cash:

Pages in 1884 catalogue.	Discount Per cent.
2. No. 2. Narrow Fast Joint Butts	.50
3. No. 3. Broad Fast Joint Butt	.65
3. No. 50. Loose Joint Butts	.65
4. No. 152. Loose Joint Butts	.65
4. No. 153. Butts	.65
4. No. 156. Loose Joint Butts	.65
5. No. 158. Butts	.65
5. No. 159. Loose Joint Butts	.65
6. No. 458. Boston Finish Butts	.80
8. No. 472. Berlin Bronzed Butts	.80
9. No. 476. Berlin Bronzed Butts	.80
10. No. 478. Berlin Boston Butts	.80
11. No. 896. 899. Bronze Butts	.65
12. No. 875. Bronze Butts	.70
13. No. 895. 898. Bronze Butts	.65
14. No. 593. Polished Brass Butts	.65
15. No. 893. Bronze Metal Butts	.65
16. No. 1593. Polished Brass Butts	.70
16A. Brass and Bronze Metal Butts	.60
17. No. 1894. Bronze Metal Butts	.60

18. No. 886. Bronze Cap Butts	.70	93. Square Bolts, Nos. 2004, 400, 1900, 1400	.65
19. No. 762. Nickel Cap Butts	.60	94. Square Cased Bolts	.65
20. No. 42. Loose Pin Butts	.65	95. Square Cased Bolts, excepting 1902	.65
20. No. 43. Butts*	.65	96. No. 801. Square Cased Bolts	.55
20. No. 46. Loose Pin Butts	.65	97. Nos. 505 and 703. Square Cased Bolts	.55
21. No. 142. Loose Pin Butts	.65	98. Square Cased Bolt	.60
21. Add new No. 148. Bronzed Butts, style of No. 142, sizes and list prices as No. 143, without screws	.65	99. No. 332. Shutter Bolts	.60
21. No. 143. Butts*	.65	100. No. 337. 338. Shutter Bolts	.60
21. No. 146. Loose Pin Butts	.65	101. Shutter Bolts	.60
22. No. 92. Loose Pin Butts	.60	102. Foot Bolts	.65
22. No. 137. Loose Pin Butts	.75	102. Foot Bolts, excepting 1391	.65
22A. No. 135. Boston Finish Butts	.80	103. Foot Bolts	.65
23. Loose Pin Butts, No. 235	.80	104. 105. Chain Bolts	.65
23. Loose Pin Butts, No. 435	.80	105. 106. Chain Bolts, English Bronzed are void	.65
24. Loose Pin Butts, No. 236	.75	108. 109. Chain Bolts	.65
24. Loose Pin Butts, No. 436	.75	110. 111. Chain Bolts	.60
24. Loose Pin Butts, No. 335. English Bronzed, see Tokio Goods.	.65	112. 113. Mortise Door Bolts	.55
24. Loose Pin Butts, No. 437	.70	114. Mortise Door Bolts	.60
25. Loose Pin Butts, Nos. 896, 897	.75	115. Ship Flush Bolts	.55
25. Inside Shutter Hinges, Nos. 813 to 824	.65	115. No. 33. Brass Flush Bolts	.55
25. Inside Shutter Hinges, Nos. 810, 811, 815, 818	.65	115. Other Flush Bolts, Brass and Plated	.60
31. Parliament Butts, Nos. 290, 293, 296	.65	116. No. 65. Brass Flush Bolts	.60
31. Parliament Butts, Nos. 590, 790	.65	116. No. 80. Brass Flush Bolts*	.60
31. Parliament Butts, Nos. 1495 to 2898	.65	116. No. 89. Nickel-Plated Flush Bolts	.60
32. Parliament Butts, Nos. 2893, 2894	.65	117. No. 85. Brass Flush Bolts	.55
32. Inside Shutter Hinges, Nos. 813 to 824	.65	117. No. 105. Brass Flush Bolts*	.60
33. Inside Shutter Hinges, Nos. 410, 411, 415	.65	118. 121. Wrought Flush Bolts	.55
33. Inside Shutter Hinges, Nos. 810, 811, 815, 818	.60	122. No. 86. Bolts	.60
34. Inside Shutter Hinges, Nos. 420, 425	.65	122A. Flush Bolts	.55
34. Inside Shutter Hinges, Nos. 820, 825, 828	.65	122B. Flush Bolts	.60
35. Inside Shutter Hinges, Nos. 460, 463	.65	123. No. 98. Flush Bolts*	.60
35. Inside Shutter Hinges, Nos. 860, 863	.70	124. No. 94. Bronzed Flush Bolts	.65
35. Pin Hinges	.55	124A. Mortise Flush Bolts	.55
36. L. P. Surface Butts	.65	124B. Flush Bolts	.55
36. Refrigerator Hinges, No. 400	.50	124C. B. M. and Imperial Flush Bolts	.55
36. R. frigerator Hinges, No. 800	.45	125. Flush Bolts, Nos. 89, 109*	.60
36. B Model Spring Hinges*	.60	126. 127. B. M. and Imperial Flush Bolts	.55
37. Spring Hinges, Nos. 150, 250	.60	128. 129. Bronze Metal Flush Bolts	.60
37. Spring Hinges, Nos. 1150 to 2250	.60	130. Mortise Flush Bolts, Nos. 1108, 1109	.70
38. Spring Hinges, Nos. 181, 281	.60	131. Mortise Flush Bolts	.70
39. Surface Spring Hinges	.55	132. Extension Flush Bolts	.65
40. 41. Mortise Spring Hinges	.55	133. Cupboard Bolts	.60
45. Royal Spring Hinges, Nos. 101 and 1101	.60	134. Cupboard Bolts*	.60
45. Japanned	.60	135. Cupboard Bolts	.60
45. Royal Spring Hinges, all others. Bronze Metal	.40	135. Brass Flat Bolts	.60
46. Victor Door Springs	.50	136. Door Buttons	.60
46. Champion Door Springs	.50	137. Door Buttons, Nos. 5 and 15	.55
46A. Eclipse Door Springs*	.50	137. Door Buttons, Nos. 32 and 33	.60
46B. C. Eclipse Door Checks*	.50	138. Cupboard Latches	.60
47. Torrey and S. Door Springs	.75	139. Cupboard Catches, Nos. 3230 to 3432	.65
47. Barber Door Springs	.55	140. Cupboard or Locker Catches	.60
48. Strap and T Hinges	.70	140. Elbow Catches	.60
49. Crate Hinges and Hinge Hasps	.70	140. Barn Door Elbow Catches	.60
49. Crate Hasps	.70	141. Lever Cupboard Catches, Nos. 6310 to 6411	.50
50. Galvanized Strap and T Hinges	.65	141. Lever Cupboard Catches, Nos. 6520 to 6625	.55
51. Trap Door Hinges, No. 30	.60	142. Brass and Plated Cupboard Catches	.55
51. No. 190. Fast Joint Plate Hinges, 6, 8, 10 and 12 inch, per 100 pounds, \$5.75	.Net	143. Show Case Catches	.55
51. No. 160. Fast Joint Plate Hinges, 14 inch and larger, per 100 pounds, \$4.75	.Net	144. Flush Ring Show Case Catches	.55
51. No. 162. Loose Joint Plate Hinges, 6, 8, 10 and 12 inch, per 100 pounds, \$5.75	.Net	145. Show Case Catches, Nos. 31, 23	.55
51. No. 162. Loose Joint Plate Hinges, 14 inch and larger, per 100 pounds, \$4.75	.Net	146. 147. Rural Cupboard Catches	.60
52. No. 168. Hook Hinges: 8, 10 and 12 inch, per 100 pounds, \$6.75; 14 inch and larger, per 100 pounds, \$6.50	.Net	148. Rural Cupboard Catches	.60
52. No. 79. Welded Hook Hinges	.55	149. Japanned Cupboard Catches	.60
53. No. 78. Welded Hook Hinges	.55	150. Cupboard Catches	.60
53. No. 96. Hook Hinges: 8, 10 and 12 inch per 100 pounds, \$5.75; 14 inch and larger, per 100 pounds, \$4.75	.Net	151. Cupboard, Nos. T442A and Y442A	.55
53. No. 94. Hook and Eye Hinges	.55	151. Cupboard, Nos. K442A and Y442A	.60
54. Rolled Plate and Raised Hinges	.65	152. Cupboard Catches	.55
55. Rolled Blind Hinges, Nos. 32 and 34	.50	153. 157. Cupboard Catches	.60
55. Rolled Center Blind Hinges, Nos. 232, 234	.55	158, 159. French Window Catches	.55
55. Rolled Center Blind Hinges, Nos. 232, 235	.55	160. French Window Catches	.55
56. Blind Hinges	.70	161. Transom Catches	.50
57. Blind Hinges, No. 12	.75	162, 163. Cupboard Turns	.60
57. Wrought Turn Buckles	.60	164. Cupboard Turns*	.60
58. Drops and Pins	.70	165. Cupboard Turns	.60
58A. B. Blind Fasteners	.55	167. Dowel Catches	.70
59-65. Gate Hinges*	.50	167. Closet Catches	.70
66-69. Gate Hinges*	.60	168. Screen Door Catches, Nos. 200, 400, 600	.60
69. Gate Sockets	.60	168. Screen Door Catches, Nos. 8201, 8401, 8801	.70
71. Gate Latches, No. 8	.60	169. Screen Door Catches, Nos. 8100	.60
71. Upright Gate Latches	.55	170. Screen Door Catches, excepting 6840 to 6846	.60
72. Gate Latches*	.55	171, 172. Screen Door Catches	.60
72. No. 65. Wrought Gate Latches	.40	172A. Window and Door Screen Brackets	.60
73. Barn Door Rollers	.60	173. Chain Door Fasts	.65
73. Barn Door Hangers	.60	174B. Ladd's Patent Door Fasteners	.55
74. Wood Track B. D. Hangers	.55	175-177. Chain Door Fasts	.60
74. N. E. Barn Door Hangers	.60	178-1824. Letter Box Plates	.60
75. Sterling Barn Door Hangers	.65	178-180. Door Bells*	.60
75. Barn Door Stays	.55	180. 181. Levers for Door Bells	.60
76. Barn Door Rail, Nos. 2 to 14	.60	180-185. Levers for Door Bells	.60
76. Barn Door Rail, Nos. 24 to 47	.60	186. Bell Pull	.50
76. Barn Door Bottom Rail	.60	187. Slide Bell Pulls	.50
76. Sliding Door Rail	.60	188. House Bells on Carriages	.40
76A. Wrought Sliding Door Rail	.60	189. Alarm Door Bells	.60
77. Tower Bolts (list of 4 inch \$1.00)	.60	190. Door Knockers	.60
77. Barrel Bolts*	.60	191. Check Springs	.65
78. 79. Wrought Barrel Bolts	.60	192. 200. 301. Bell Cranks	.50
79. 80. Barrel Bolts (excepting 871)	.60	192. Mortise Bell Cranks	.50
80. Barrel Bolts, No. 871	.60	193. Pulley Bell Cranks	.55
81. Barrel Bolts, No. 272 $\frac{1}{2}$, 472, 462 Add.	.60	194. Roggin's Latches, No. 62	.60
81. Barrel Bolts, No. 862	.60	194. Roggin's Latches, Nos. 30, 130	.60
82. Brass Barrel Bolts	.60	194. Roggin's Latches, Nos. 32, 132*	.60
83. Brass Barrel Bolts	.60	195. Bronzed Door Handles, Nos. 21 to 23	.65
84. 85. Elm City Barrel Bolts	.60	196. Bronzed Door Handles, Nos. 65, 67	.55
85. No. 390. Neck Bolts	.60	196. Japanned Door Handles	.55
86. No. 421. Neck Bolts	.60	197. Barn Door Latches	.55
86. No. 522. Neck Bolts	.60	197. Barn Door Hasp and Latch	.55
87. Nos. 325, 525. Neck Bolts	.60	198. Japanned Store Door Handles	.60
87. No. 316. Wrought Spring Bolts	.60	199. 211. Bronzed Store Door Handles	.60
88, 89. Wrought Spring Bolts	.60	200. 212. No. 47. Store Door Handles	.60
89, 90. Wrought Square Bolts	.60	200. No. 48. Store Door Handles*	.60
90, 91. Wrought Square Bolts	.60	201. Bronzed Store Door Handles	.60
92. No. 400. Square Bolts	.60	201. Japanned Store Door Handles	.60
92. Floor Plates and Staples	.60	202. Brass, Plated and Bronze Store Door Handles	.60
92. Cast Brass Square Bolts	.60	202. Bronze Metal Store Door Handles	.55
92. Cast Brass Square Bolts	.60	203. Bronze Metal Store Door Handles	.60
93. 94. Bronze Metal Store Door Handles	.60	204. 224R. Store Door Handles and Lock	.60
94. 95. Bronze Metal Store Door Handles	.60	204. 224R. Store Door Handles	.60
95. 96. Bronze Metal Store Door Handles	.60	205. 234. Flush Barn Door Pulls	.60
96. 97. Bronze Metal Store Door Handles	.60	205. 235. Japanned Door Pulls, Nos. 502, 503, 504	.55
97. 98. Bronze Metal Store Door Handles	.60	205. 235. Door Pulls, excepting 307, 398	.60

26, Door Pulls, excepting 305	60	Window Spring Bolts, Nos. 37, 38, 47, 57.	49-494	Twine Boxes.....
27-241, Door Pulls.....	60	58.....	495	Paper Clips.....
242-245, Push Plates.....	60	386, Window Spring Bolt Sockets.....	496	Paper Weights.....
246-251, Drawer Pulls, list of No. 636, \$6.50.	65	387, Window Springs, Nos. 0 to 7.....	496&10	Paper Files.....
252-257, Drawer Pulls*.....	70	Window Springs, Nos. 17, 19.....	496&10	Paper File Hooks.....
258, 259, Drawer Pulls.....	70	388, Brass Window Bolts	497	Bird Cage Hooks*.....
260, Drawer Pulls.....	60&75	389, Sash Fastas and Props	498	Bird Cage Hooks.....
260, 264, Drawer Pulls.....	65	390-403, Sash F'asteners*.....	498-503	Bird Cage Hooks.....
261, Drawer Pulls.....	65	404, Sash Fasteners, Nos. 950, 951.....	504	Hanging Basket or B. C. Hooks.....
262, 263, Drawer Pulls.....	60&25	Sash Fasteners, Nos. 952-969.....	504	Match Safes, No 60.....
264, 265, Drop Handles and Escutcheons.....	55	Sash Fasteners, Nos. 1052-1069.....	505	Match Safes, Nos. 34, 35, 37.....
266, Drop Handles.....	60&25	New 404 A. Sash F'asteners.....	506	Match Safes, Nos. 30, 31, 33.....
266, Japanned Lifting Handles.....	60	405-407, Sash Fasteners.....	506, 507	Match Safes.....
267, Brass Lifting Handles.....	55	New 408 A. B. Shaw's Imp'vd Transom Lifters.....	508	Boot Jacks.....
268, 269, Lifting Handles.....	55	410, Sash Centers.....	509	Nut Jacks.....
270, Brass Ring Handles.....	65	411, Shutter Screws	510	Cork Pressers.....
270, No 25, Shelf Box Handles.....	65	411, Shutter Lifts	510	Garden Trowels.....
271, Brass Drawer and Trunk Handles.....	55	412, Stubs and Plates	510	Garden Forks.....
272, Flush Rings.....	60	412, 413, Sash Rollers	510	Garden Hooks.....
272, Brass Flush Drawer Handles.....	50	414, Shutter Sheaves*.....	510A	Cast Steel Garden Trowels.....
273, Flush Chest Handles.....	60&25	414, Hatfield Pattern Sheaves*.....	511	Ice Axes and Awls.....
273, Flush Trap Door Rings.....	60&10	New 414A, Sliding D'or Sheaves, No. 30.....	512	Carpet Stretchers.....
274, Flush Chest Handles.....	70	Sliding Door Sheaves, No. 30.....	512	Tack Claws, Nos. 0 to 11.....
275, Chest Handles*.....	65	414A, Sliding Door Stops	512A	Tack Claws, Nos. 25, 26 and 46.....
276, Tub Handles, Nos. 15 and 15.....	60	414A, Elastic Base Knobs, Wood	513	Tack Claws, Nos. 20-31.....
276, Wrought Tub Handles.....	60&10	414A, Elastic Base Knobs, Iron	514	Tack Hammers
277, Wrought Chest Handles, Nos. 71 to 176. 60&10	Nos. 1 to 106.....	415, Sash Cord Irons	515	Tack Hammers (except No. 32)
278-279, Clothes Line Hooks.....	60&10	415, Axle Pulleys, Nos. 0, 00.....	516	No. 32 Tack Hammers.....
280, Clothes Line Hooks, Nos. 41 and 51	60&10	416, Axle Pulleys, (list No. 6, \$0.45)	516	Tack Hammers, No. 00.....
280, Hat Rack Hooks.....	60	417, Axle Pulleys	517	Sad Iron Stands*.....
281, Store Rack Hooks.....	60	418, Axle Pulleys	517	Coffee Pot Stands.....
281, Harness or Baggage Hooks.....	60	419, Axle Pulleys	518	Sargent-Sprague Can Openers.....
282, Harness Hooks*.....	60	420, Axle Pulleys	518	No. 5 Can Openers.....
283, Harness Hooks.....	60	421, Dumb Waiter Pulleys	519	Cake Turners.....
284, Hotel Hooks.....	5	421, Ceiling Pulleys	519	Pasta Jiggers.....
285, Hotel Hooks, No. 94.....	55	422, Hot House Pulleys	520	Mop Heads.....
285, Hotel Hooks, No. 95.....	60	423, Upright Pulleys	520	Sausage Stuffers, Nos. 22 and 24.....
286, 287, Coat and Hat Hooks, to screw	60	423, Side Pulleys	520	Perry Sausage Stuffers.....
287, Coat and Hat Hooks, to drive.....	60	424, Screw Pulleys	520	Meat Cutters, Nos. 32 and 33.....
288, 289, Coat and Hat Hooks.....	60	426, Incased Screw Pulleys	520B	Eclipse Meat Cutters.....
289, 291, Coat and Hat Hooks.....	55	427, Incased Swivel Pulleys, No. 42	521	Hale Meat Cutters.....
292, Coat and Hat Hooks.....	55	427, Clothes Line Pulleys, Nos. 63 and 163	522	Tobacco Cutters.....
293, Coat and Hat Hooks.....	60	428, 429, Clothes Line Pull-ys	524	Stebbins' Genuine Gates.....
294-299, Coat and Hat Hooks, list of 86 is \$14.	55	430, Clothes Line Pulleys, No. 64	525	Stebbins' Oil Vat Gates.....
300-302, Coat and Hat Hooks.....	55	430, 432, Tackle or Awning Pulleys	525	Net.....
303, Coat and Hat Hooks*.....	55	433, Well Wheels*.....	525	Stebbins' Milk Can Gat.s.....
304, Coat and Hat Hooks.....	55	434, Hay Fork Pulleys	526	Self-Boring Stebbins' Gates.....
305, Coat and Hat Hooks*.....	55	435, Hay Fork Pulleys	526B	Self-Setting Game Traps*
306-307, Coat and Hat Hooks.....	60	436, Brass Pulleys	527	Steel Game Traps*
308-315, Coat and Hat Hooks.....	55	437, Brass Upright Pulleys	528	Spring Balances.....
316-318, Wardrobe Hooks.....	55	437, Brass Screw Pulleys, Nos. 35, 37	528A	Circular Spring Balances.....
319, Japanned Screw Hat Hooks.....	55	438, 439, Line Cleats	529	Scale Beams.....
319, Brass Hat Hooks.....	55	440, 443, Foot Scrapers*	530	File Handles.....
320, Ceiling Hooks.....	55	444, Japanned Shelf Brackets	530	Chisel Handles.....
320B, Chandelier Hooks.....	55	445-448, Shelf Brackets	531	Screw-Driver Handles.....
321, Ceiling Hooks.....	50	448A, Brass-Plated S. Brackets	531	Awi Hafts.....
321-323, Chandelier Hooks.....	55	449-452, Shelf Brackets	531	Patent Awl Hafts*
New 322A, Chandelier Hooks.....	55	452, 452A, 43, Hand Rail Brackets	532	Brad Awls*
New 322A, Chandelier Hooks.....	55	453, Hand Rail Plates	532	Brad Awl Handles
324, Chandelier Hooks, Nos. 250, 450.	55	454, Hand Rail Screws	532	Handled Brad Awls
Chandelier Hooks, No. 410.	55	455, Washers, 8 $\frac{1}{4}$ ¢ from list	533	Aiken's Pattern Awls and Tools
325, Chandelier or Braced Screw Hooks.....	50	455, Corner Irons	533	Aiken's Genuine Awls and Tools
325, Lamp Hooks.....	50	456, Hinge Nails	533	Aukens Extra Awls and Tools
326, Screw Hooks, No. 412*.....	75&10	457, Hinge Rivets and Wagon Nails	534	Peg Awls
329, Screw Hooks, Nos. 415, 419.....	60&25	458, Wrought Staples	534	Sewing Awls
327, Wire Drive Hooks.....	50	458A, No. 15, Clinch Staples	534	Iron Hoe Hammers
327, Brass Drive Hooks, No. 405.....	60&25	459, Wrought Staples, Nos. 105, 106, 107	535	Iron Nail Hammers
328, Brush or Duster Hooks.....	10	459, Wrought Staples on Plate*	535	Cast Shingling Hatchets
329, Coppered Screw Hooks.....	50	460, Wrought Hooks and Staples*	536	Brass Plumb Bobs
329, Picture or Mirror Hooks.....	70	461, Extra Heavy Hooks and Staples*	536	Lead Plumb Bobs
329, Cup Hooks, No. 80.....	70&10	462, 463, Hasps and Staples	537	Japanned Plumb Bobs
Cup Hooks, No. 81.....	70&10	464, Hasps and Staples, Nos. 40, 41, 42	537	Appleton's Washer Cutters
329, Cup Hooks, Nos. 82, 89, 90.....	70&10	464, Wagon Bow Staples*	537	Pocket Wrenches*
330, Iron Hooks and Eyes, Nos. 50, 55.	60&25	464, Wagon Stake Irons	538	Aiken's Patent Pocket Wrenches
Brass Hooks and Pins, No. 63.....	60	465, S Hooks*	538	Aiken's Saw Sets
331, Brass Hooks and Eyes.....	60	465, D Links*	538	Bench Hooks
332, Cabin Door Hooks.....	55	465, Open Links*	538	Nail Sets
333, Safety Gate Hooks, No. 100.....	50&10	466, Aw'ing Hooks*	538	A. B. C. D. Sargent's Improved Iron Planes
333, 334, Gate Hooks and Cornice Hooks.....	75	466, Sign Hooks*	539	Steel Rules
334A, Mosquito Bar Eyes.....	75	467, Pipe Hooks*	540	Steel and Iron Squares*
335, Stair Rod Eyes*	75	467, Leader Hooks*	541	Nickel Plated Squares*
Bird Cage Eyes.....	75	468, Wire Meat Hooks*	542A	B. C. D. crew Drivers, Revised Inst.
336-344, Bright Wire Goods.....	75	468, Wrought Meat Hooks*	543	Brass saw Screws
345, Wire Cup Hooks.....	75	469, Tinned Wrought Meat Hooks*	543	Saw Rods
346, Belt Hooks.....	75&10	470, Bar Meat Hooks*	543	Melting Ladies
347, Wire S Hooks.....	55	471, Bar Meat Hooks*	543	American Shears
348, Roller Ends*	55	472, S Meat Hooks*	543	Domestic Bit Braces
348, Shade Brackets*	50	472, Ham Hooks	543A	Fence Hook Clasps
349, Molding Hooks.....	50	473-4, Well Wheel Hooks	543B	Patent Wire Fence Hooks
349, Porcelain Center Curtains in Pins.....	50	473-4, Swing Hooks	543C	Wire Fence Hook Braces
350, Brass Head Picture Nails Nos. 5, 4.....	50&10	472-6, Eye Bolts*	544	Double Pointed Tacks in papers
Porcelain Head Picture Nails, Nos. 5, 60, 50&10	50&10	Screw Hooks	544	Double Pointed Tacks in bulk
351, Porcelain Head Picture Nails, Nos. 10, 11.....	50&10	473, Hammock Hooks	544	Pointed Tacks
351, Porcelain Picture Knobs.....	60&25	474, Trap-Door Rings*	544	Pointed Tacks
352, Porcelain Drawer Knobs, Nos. 5, 7.....	55	475, Hitching Rings, Nos. 5, 6, 7	544	Pointed Tacks
352, Porcelain Stove Knobs, No. 8.....	55	475, Hitching Rings, No. 15, 16, 17	544	Pointed Tacks
353, No. 1, Porcelain Shutter Knobs*	60	476, Hitching Rings, Nos. 25 to 37	544	Pointed Tacks
No. 10, Porcelain Shutter Knobs*	65	476, Hitching Hooks and Rings	544	Pointed Tacks
No. 15, Porcelain Shutter Knob*	65	477, Hitching Post Caps	544	Pointed Tacks
354, Porcelain Shutter Knobs*	65	478, Hitching and Halter Chains	544	Pointed Tacks
355, Shutter Knobs*	50	479, Breast Chains	544	Pointed Tacks
355, 358, Shutter Knobs	50	479, Rein Chains	544	Pointed Tacks
359, Sash Knobs	60	480, Shaw Slide-Lock Snaps	545	Wrought Nail Grips
359, Brass Kettle Knobs	60	480, Double Lock Snaps	546	Cotton Hooks
Japanned Kettle Knobs	60	480, Covered Spring Snaps	546	Box Hooks
360, 361, Sash Lifts*	60	480A, Patent Open Spring Snaps	547	No. 72, Hox Ch sels
362A, Window Screen Sash Lifts.....	60	480A, Covered Spring Snaps*	547	Cast Steel Box Chisels
363, Sash Lifts	60	480B, New German Snaps*	547	Cast Steel Cold Chisels
364, Sash Lifts*	60	481, Sargent's Patent Snaps	548	Carpenters' Pincers, No. 40
365, Sash Lift and Lock, excepting 360, 362.....	60	482, Cock Eye Snaps	548	Carpenters' Pincers, No. 42
366, Flush Sash Lifts.....	60	482, Cattle Ties, Nos. 5 and 1	548	No. 52, Horse Shoeing Pincers
367, Flush Sash Lifts.....	60	482A, Cattle Ties, No. 4, \$2.35 per dozen	548A	No. 62, Horse Shoeing Pincers
368, Flush Sash Lifts.....	60	483, Cattle Ties*	549	No. 32, Hoof Nippers
368B, Flush Sash Lifts.....	60	483, Halter Trimnings or Cattle Ties	549	Blacksmiths' Tong
369, Flush Sash Lifts, excepting 366, 367, 368.....	60	484, Rope Halter Leads*	549	Blacksmiths' Butterises
Flush Sash Lifts, 366, 367, 368.....	60	Rope Horse and Cattle Ties*	550	Blacksmiths' Drills, Nos. 5, 6
370, Flush Sash Lifts.....	60	484A, Hitching Halters*	550	Blacksmiths' Drills, Nos. 10
371, Window Pulls.....	60	485, Rope Horse and Cattle Ties*	550	Sockets for Square Shank Drills
372, 373, Sash Pull Plates.....	60	486, Bull Rings, Nos. 10 to 22	551-553	Grindstone Fixtures
374, Sash Pulls.....	60	486, Bull Snaps	554	Vises, Nos. 00 to 4
374A, Sash Pulls.....	60	486A, Eureka Hog Rings and Ringers	554	Vises, Nos. 10 to 14
Bedford Patent Window Attachment.....	60	487, Cattle Leaders	555	Vises, Nos. 34
374B, Perry Patent Sash Pulls and Plates.....	60	487, Ox Bow Pins	555	Swivel Bench Vises
375, Japanned Shutter Bars.....	60	488, Ox Balls*	556	Saw Vises
Bronzed Stutter Bars.....	60&10	488, W. M. Mane Combs	556	Saw Vises
376, Shutter Bars.....	60&10	489, Carriage Knots and Fence Spikes	557	Iron Bench Screws*
377, Shutter Bars, excepting No. 133.....	60&10	490, Sheep Bells	557	Extra Length Bench Screws
378, Shutter Bars, excepting No. 163.....	60&10	490, Wrought Cow Bells	558	Clamp Heads
379-385, Shutter Bars.....	60&10	491, Kentucky Cow Bells*	559	Door Clamps
386, Window Spring Bolts, Nos. 10 to 22 inclu-	60&25	491, Western Cow Bells*	559	Jack Screws

560. Carriage Clamps *	70
560. Cabinet Makers' Clamps	60 ²
561. Stool pivots	60
561. Piano Stool Screws	60
561. Chair Screws	60
562. Table Fasteners	60
562. Table Leaf Supports	50 ² 5
563. Thread Escutcheons	60
563. Looking Glass Plates	60
563. Looking Glass Screws	60
564. Veneer Points	10
564. Bed Hooks	65
565. Bed Keys	50
566, 567. Bedstead Fastenings	50
568A. Plate Casters, Nos. 1 to 27	50 ² 11
Plate Casters, Nos. 31 to 87	50
Plate Casters, Nos. 41 to 67	50
Plate Casters, Nos. 71 to 107	50
568B. Phila. Casters, Nos. 901 to 927	50 ² 11
Phila. Casters, Nos. 931 to 937	50
Phila. Casters, Nos. 1021 to 1027	50 ² 11
Phila. Casters, Nos. 941 to 1057	50
568C. Round Shallow Socket Casters	50
Deep Socket Casters	45
568D. Piano Forte Casters, except Nos. 38 and 39	50 ² 11
Piano Forte Casters, Nos. 38 and 39	50
568E. Bedstead Casters, Nos. 401 to 426	50 ² 11
Bedstead Casters, Nos. 432 to 457	50
Bedstead Casters, Nos. 441 to 126	50 ² 11
568F. Globe Wheel Bed Casters	50 ² 11
568G. Bracket Bed Casters	50 ² 11
568H. Bracketed Bed Casters	50 ² 10
568I. Heavy English Pattern Casters	11
Casters for Iron Bedsteads	50 ² 11
568J. Rubber Tire Casters	25
569, 588. Store Truck Casters	50
584. No. 874. Store Truck Casters	50
584. Rubber Tire Truck Casters	25
585. Cast Iron Coal Shovels	55
585. Cast Iron Coal Sifters	55
586. Stove Cover Lifters	55
587. Iron Pokers	50
587. Brass Head Pokers	50
587. Wood Handle Pokers	60
588. Coal Tongs, Nos. 123 to 222	60
Coal Tongs, Nos. 126 and 236	60
589. Bronzed Iron Fire irons:	
In Sets	60
In Pairs	60
Shovels only	60
Tongs only	60
Pokers only	55
590. Cottage Fire Sets:	
Nos. 21, 23	60 ² 10
Nos. 25, 26	60
Nos. 20, 22	60 ² 11
591. Cottage Fire Sets:	
Nos. 125, 225	60
Nos. 122, 222	60 ² 10
592. Bronzed Fire Sets	60
593, 596. Fire Iron Stands	60
597. Umbrella Stands	61
598, 599. Blower Stands	60
600, 601. Fire Dogs	60 ² 10
The following are their discounts on Bronze Plated and Ekado design goods, applying to their pamphlets representing them. There is the 10 per cent extra discount for prompt cash:	
Bronze Plated Goods.	
No. Y 458. Loose Joint Butts	75
No. Y 136. Loose Pin Butts	75
No. Y 438. Loose Pin Yeddo Bronzed Butts. Add	
No. K 438. same as Y 438, Tokio Bronzed	75 ² 10
No. K 436. Loose Pin Butts	75 ² 10
No. K 446A. Loose Pin Butts	75 ² 10
No. Y 446A. Loose Pin Butts	75 ² 10
No. K 1495. Parliament Butts	70 ² 10
No. Y 1495. Parliament Butts	70 ² 10
No. K 415. Shutter Hinges	70 ² 10
No. Y 415. Shutter Hinges	70 ² 10
No. K 425. Shutter Hinges	70 ² 10
No. Y 425. Shutter Hinges	70 ² 10
Light Barrel Bolts*	66%
Square Bolts	66%
Square Cased Bolts	66%
Bottom Bolts	66%
Foot Bolts	66%
Chain Bolts	60 ² 10
Flush B. Its Sunk Thumb Piece	60 ² 10
Mortise Flush Bolts	75
Screen Door Catches	66%
French Window Catches	66%
Cupboard Catches	66%
Cupboard Turns	66%
Store Door Handles	66%
Door Pulls	60
Push Plates	60
Bell Levers	60 ² 10
Coat and Hat Hooks	60
Chandelier Hooks	60
Drawer Pulls	66%
Shutter Knobs	60
Sash Lifts	66%
Sash Lift and Lock	66%
Flush Sash Lifts	60 ² 10
Shutter Bars	60 ² 10
Sash Fasteners	70 ² 10
Ekado Design Goods.	
No. C 885 E. Loose Joint Butts	66%
No. C 848 E. Loose Pin Butts	66%
No. C 863 E. Shutter Hinges	65
No. C 815 E. Shutter Hinges	65
No. C 825 E. Shutter Hinges	65
Nos. C 1895 E. and C 2895 E. Loose Joint Parliament Butts	65
No. C 886 E. Sash Lifts	55
Nos. C 887 E. and C 113 E. Sash Lifts	55
No. C 84 E. Shutter Knobs	50
No. C 115 E. Sash Fasteners	70 ² 10
No. C 803 E. Sash Pul. Plates	55
No. C 294 E. Shutter Bars	60
No. C 4850 E. Cupboard Turns	60
No. C 4852 E. Cupboard Turns	60
No. C 821 E. Cupboard Catches	55
Nos. C 392 E. and C 492 E. Drawer Pulls	66%
No. C 105 E. Flush Bolts See page 124 B in 1884 Catalogue	void

The Copper Pool.

The Pall Mall *Gazette* prints the following interview with M. Eugene Secrétan, the managing director of the Société des Métaux, of Paris, and the head of the great copper syndicate:

"The whole thing has been managed by me," said M. Secrétan, "on behalf of the Société des Métaux, which has behind it immense financial resources, but the syndicate, of which there has been so much talk, has no existence. So far the affair has been essentially French. We don't refuse the co-operation of English capital, but we have not sought, and have no need to seek, it. Interested speculators are accusing me of motives which have never actuated me. Our only purpose is that every miner, dealer and manufacturer should have fair remuneration for his work. We want, in short, to put the copper trade on a sound and healthy basis, which it has not been for a good many years."

"Then you think prices were decidedly too low?" "Decidedly. Formerly the trade was controlled by the English smelters, but for some years there has been a want of courage in the English market which allowed prices to drop below a paying level. I am not an old man, but when I began business the price of tough copper was £125 per ton. As late as 1872 Chili bars were £110, and last year they fell as low as £38. /10 per ton."

"What was the reason of the fall?" "The large supplies from Montana and Arizona helped very materially. The surface ores of Montana were rich and easily and cheaply got, and the consequence was that in six years the production of America was more than trebled. Then, with the continued depression in trade and the low price of wheat, people got it into their heads that all produce must go down. The result was that many mines had to be closed, and others were worked with the smallest margin of profit. Meanwhile the consumption was growing and stocks were decreasing. In August, 1886, the total stocks, including the quantities afloat, were 66,000 tons, and on September 30 last they had fallen to 49,000 tons, without anybody having taken any notice of it, and still copper stood at \$39. /15. Since then stocks have fallen even lower, and on the 31st of December they only amounted to 42,000 tons. When the copper trade was controlled years ago with stocks relatively larger than we have to-day the price was much higher than it is now."

"Then, what do you consider a fair price for copper?" "The normal value would be, I think, somewhere between the two extremes I have mentioned, £125 and £38. 10/. The present price would be near the mark. We cannot, of course, help other people 'cornering' the market; but there is no intention on the part of those for whom I am acting to carry the price to an excessive level, but at a moderate or paying level there are hosts of people who will be benefited by what we are doing. In our own immediate entourage we are insuring an honest livelihood to at least 6000 people; for remember that we are large consumers. High prices mean high wages to every one engaged in the metal trade. Then there are millions sterling employed in mines, at very great risk. There is always danger of inundations, fires, &c., and to set aside a reserve fund to meet these contingencies it is not too much to assume that 10 per cent. should be got on the money invested. Lately many mines have not only not paid 10 per cent., but the shareholders have not got a single penny out of them.

Even at the present price of the metal a great many mines would not pay 10 per cent."

"What is the purpose of the negotiations you are conducting at present?"

"Generally speaking, they are for the purpose of conciliating the interests of manufacturers and producers. Our aim is to prevent an unnecessary output. If the production remains as at present there is enough for the consumption of the world. So far, there has been no restriction. The higher prices will, of course, stimulate production, but it takes months to increase the output, and it is the aim of the arrangement I am trying to effect to prevent the market being deluged and prices being brought down to the old unremunerative level."

"But will the higher price not check consumption?" "Speculation and uncertainty would check consumption, but not a steady, moderate price. The present level would not prevent the use of copper for any purpose to which it is at present put. More than that, consumption is bound to increase by the advance of telegraphy, telephony and electric lighting. To light London alone would take a fifth of the present year's supplies to England and France."

"Your arrangements are not yet complete, I presume?" "No, because we are treating separately with the different interests, which takes time, and we have not yet been able to settle with all, but there is no doubt that we will eventually do so, as it is to their advantage, and there is equally little doubt that the scheme as a whole will succeed."

"But what if new mines are opened up?"

"It is more than probable that the extension of railways and telegraphs to China and other Eastern countries, as well as the other growing demands to which I have alluded, will more than counterbalance any new discoveries."

"So are you confident of success?" "As far as common sense and the general interest enables me to predict, our arrangement will be a success."

"What is your idea of a normal price?"

"The normal price of the future, I should say, will be from £75 to £80."

"Have you operated on the Stock Exchange as well as on the metal market?"

"No. Our operations are confined absolutely to the metal; individuals connected with us have, of course, bought and hold copper shares."

The Pusey & Jones Company, of Wilmington, Del., recently completed a revenue cutter for the Republic of Colombia, South America. La Popa, the name of the vessel, is of iron, and is the third of her exact class built by the company within the past few years. She is 120 feet long on the 8-foot water line, 20 feet beam, molded; 10 feet 4 inches deep, from top of cross floors to top of deck beams amidships, and is sheathed to 9-foot water line with yellow pine 2½ inches thick, secured through plating by 4-inch bolts, and covered with copper sheathing metal. She is rigged as a fore-and-aft schooner, and provided with a 6-pounder Hotchkiss rapid-firing gun of the most improved type. The vessel is driven by a vertical direct-acting, surface-condensing engine 24 inches diameter, 36-inch stroke; boiler of the Scotch type, 9 feet 10 inches diameter, 12 feet long, constructed for a working pressure of 60 pounds per square inch.

The Attorney-General of Illinois, at the request of the Citizens' Association, of Chicago, will bring *quo warranto* proceedings against the Gas Trust to show cause why their franchise should not be forfeited on the ground that it has been abused, to the detriment of public interests.

New Mail Bicycle.

William Read & Sons, 107 Washington street, Boston, are manufacturing the New Mail Bicycle, which embodies several novel features, and to the general excellence of which they refer with confidence. A general view of the New Mail is given in Fig. 1, some of the special features of its construction being illustrated in Figs.



Fig. 1.—The New Mail.

2 and 3. The first and most important feature is the Trigwell ball bearing head shown in Fig. 2. The head of the ordinary bicycle is referred to as having been to a mechanical eye one of the weakest points in its construction, as this is the point of division between the two portions, the weight of the rider and the inequalities of the road tending to separate the backbone with little wheel from the head and forks attached to the front wheel. In this head the neck is left soft, not requiring to be hardened as in the cone pattern, thus doing away with the liability to breakage from this cause. It is bored and tapped at each end, and has hardened steel plugs inserted forming the bearing surfaces on which the balls run as shown in Fig. 2. In the bottom of the head is a

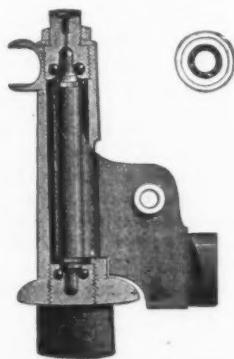


Fig. 2.—Trigwell Ball-Bearing Head.

cup in which the balls are placed, such balls running in a groove, held in place by a cap which prevents their falling out when the neck is disjointed and presenting nearly one-half their surface upon which the spindle turns. The retaining device preventing the balls dropping out when the neck is disjointed is referred to as a feature peculiar to the Trigwell ball head, which can be used by no others. The upper ball center is constructed in the same way as the lower ball center just described, and forms with the lower what is alluded to as a perfect bearing which can be tightened to a great degree without developing any tendency to stick, thus giving absolute rigidity and a perfect bearing at this point where it is most needed. The smoothness and ease of steering, the fact

that it can run at least 1000 miles without adjusting, that it uses very little oil, that the percentage of breakages is reduced to a minimum and that, in case of breakage, the parts can be replaced by the owner at a trifling cost, are mentioned as advantages of this construction.

Another novel feature in the New Mail is the Warwick Perfection tubing used in the backbones and forksides. This tubing is described as of the very finest quality, cold drawn, weldless, and differing from the ordinary tubing used on wheels in that it is of varying thickness. It has been found that when backbones or forksides break, such breakage is almost always at the upper end near the point of junction with the neck, but instead of using a heavier gauge of metal, giving increased weight, the Perfection backbones and fork-



Fig. 3.—Improved Rim.

sides in this machine are tapered internally—that is, while the outside is made with parallel walls the inside walls are on a taper, so that the metal is of 14 gauge at the upper end, tapering internally to 18 gauge at the lower end. This construction is said to have worked most admirably and the manufacturers mention with satisfaction that they have not yet had a broken backbone or forksides on any of their New Mails now in use.

A third novelty is the improved hollow rim with thickened base, shown in Fig. 3. It differs from other rims in that the ordinary lap of metal is not made on the outside, presenting an unsightly groove and liable to be opened by contact with obstacles, but is found under the rubber tire entirely out of sight and removed from danger of opening from knocks or blows. Special emphasis is laid on the point that at the bottom of the rim there is an increased thickness of metal integral to the rim itself, which not only forms a stiffener and brace against buckling, but also strengthens the rim against a pulling through of the nipple nuts in which the

This pulley is manufactured by E. C. Stearns & Co., Syracuse, N. Y., whose object in putting this pattern on the market has been to combine strength and durability in as inexpensive a manner as possible. These pulleys are described as having hardened chilled bearings, and as

Hay Fork Pulley.

Hay-Fork Pulley.

being strong, symmetrical, handsomely japanned and finished in the best manner. An advantage of which special mention is made is that the pin can be removed, permitting the rope to be adjusted in order to allow oiling. The low price at which they are offered is referred to as resulting from the fact that the pattern is plain, and the goods constructed in such a way as to give great strength for the amount of material used.

A New Hoe.

E. S. & F. Bateman, Spring Mills, N. J., are putting on the market a new hoe, which they designate as the Superb, which is illustrated in the cut herewith given.



The Superb Hoe.

tangent spokes used in the New Mail are fastened. The success of this rim is referred to as most marked, and it is stated that not a single rim on a New Mail has buckled. These specialties, we understand, are controlled by the manufacturers, and, with other improvements incorporated in the New Mail, are referred to as justifying their confidence in the machine, of the lightness and durability of which special mention is made, a 50-inch machine weighing but 36 pounds.

It will be observed that this hoe is triangular, concave and toothed. The length of the toothed edge is 8 inches, and of the other two sides each 9 inches. The cut does not, however, fully illustrate the concavity of the hoe, which is more concave than represented. Special attention may be called to the manner in which the blade is attached to the socket. The socket is hollow throughout its length, and at the point of connection with the blade is of hexagon shape, which is ex-

panded into a hole of corresponding shape, and the end neatly turned over and headed down, making an exceedingly firm connection, a method of construction on which letters patent are pending. The blade is described as made of the best hoe steel, tempered all over and fully warranted. The manufacturers allude to the advantages possessed by this hoe, pointing out that the teeth being wedge shaped enter the ground more easily than a straight edge; that it does not clog; that, in hoeing, the weeds and grass are dragged to the surface; that it is adapted to a wide arrangement of work, and that it is attractive in appearance and sells readily.

Office Letter-Box and Card Case.

The illustrations which are given here-with represent these articles, which are being put on the market by I. S. Spencer's Sons, Guilford, Conn. The card case is

to be by the manufacturers, as well as the important advantages possessed by this article, which they regard as adapting it to the wants of the trade, and supplying a lack which has hitherto been felt. Each box is provided with a substantial lock.

Fig. 3 gives a representation of a card case which is intended to be used in connection with the boxes and furnishes paper and pencil for messages. The card cases are made of the same material and finish as the letter boxes, their dimensions being 8 inches long by 4½ inches wide.

The Safety Sash Lock.

The Champion Safety Lock and Novelty Company, 106 and 108 Canal street, Cleveland, Ohio, are putting on the market a sash lock, represented in the accompanying illustration. This lock is simple in construction, and consists of a case with an eccentric cam having a handle to

make to its simplicity, cheapness, strength and safety, and the fact that it is not liable to get out of order.

Benner's Latest Prophecy.—Samuel Benner, the famous author of the "prophecies" which bear his name, has written a letter to the *Record and Guide* in which he says: "This year, 1888, being the closing year in this cycle of low prices—seven years from 1881—is the golden opportunity to commence the foundation for a business. If there is any benefit to be derived from a knowledge of these cycles in trade, it will be in taking advantage of them. Young men who are about to commence their business career should embrace their present opportunity. There are but few of these chances in an ordinary life. It requires about ten years to complete an up and down in general trade. When the depressions which follow commercial crises reach their lowest limit, as determined by these price cycles, they afford the best opportunities for investment, and the height of speculative eras are the most dangerous periods to make a commencement in any enterprise. This is the opportunity for investors to open a mine, to build a furnace, to erect a mill, to build a ship, to equip a railroad and to make investments in agricultural, commercial and industrial operations. George Peabody laid the foundation for his fortune by buying American securities in one of our commercial depressions."

We are in receipt of a price list of the Moorhead, McCleane Company, Soho Mills, Pittsburgh, Pa. On the back of the sheet is a unique representation of galvanized iron, the peculiar crystalline appearance of the zinc coating being shown by engraving. The sheet is bordered by a blue strip, and the announcement of the company is printed in the same color. The effect of this contrast of tints is to make the representation very true to the real article. The *fac simile* of the trade-mark "Soho C.H.B." is also printed on it in red ink. On the reverse of the sheet are given price lists of galvanized sheet iron, crimped and corrugated and curved ceiling and roofing irons, open-hearth steel and other goods.

The Metropolitan National Bank, of Cincinnati, suspended on the 6th inst., and its affairs were placed in the hands of the Government. Vice-President Decamp, whose speculations in oil and natural-gas lands are said to have caused the disaster, has been arrested. As stated by the Bank Examiner, the losses will not exceed \$350,000, and "have arisen" entirely from loans on insufficient security. The president, William Means, has large iron interests in the vicinity of Ironton, Ohio. It is feared that the Fidelity Bank failure is more than paralleled.

The stockholders of the Sheffield and Birmingham Coal, Iron and Railroad Company at the recent annual meeting adopted resolutions authorizing the building of branch lines to aid in the development of the company's mineral lands in Alabama and for the immediate construction of coke ovens.

A few days ago nearly all the 1630 convicts in Sing Sing Prison were idle, including 489 previously employed in the stone works, on account of the failure of funds necessary for the prosecution of the various industries of the prison. On Friday, however, Warden Brush received word that the Legislature had voted \$250,000, and orders were at once given to resume work on Monday morning.

Judge Gresham, of Chicago, has authorized Receiver McNults, of the Wabash Railroad, to spend about \$300,000 for bridges and steel rails.

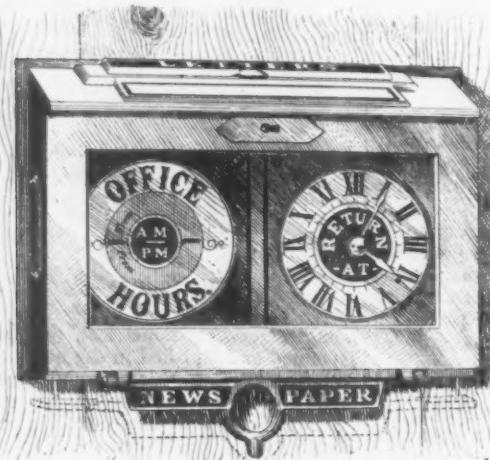


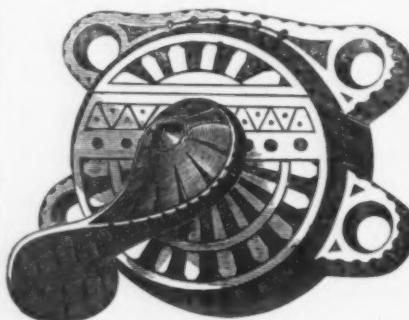
Fig. 1.—Letter Box.



Fig. 3.—Office Card Case.

represented in Fig. 3, and a general view of the letter-box is given in Fig. 1, while Fig. 2 represents one of the doors used in it. The letter-box, Fig. 1, is made of iron enameled, with nickel-plated and bronzed trimmings, and also of real bronze, with the same trimmings, its dimensions being 12 inches long, 8 inches wide and 1½ inches deep. By raising the hinged cap on the top an opening is exposed through which letters may be dropped, and by pressing the ring attached underneath, causing the rack to take the position indicated by the dotted lines, a place is provided for the reception

operate it, which is attached to the meeting rail of the lower sash, and the locking plate with a lip on its inside on the upper sash. Both case and locking plate have straight edges, so as to set flush with the



The Safety Sash Lock.



Fig. 2.—Auxiliary Door.

of newspapers, in which a good many can be easily accommodated. The front of the letter-box is a glass door which opens downward, giving access to the auxiliary door, which is hinged to the inside of the case so as to swing in a horizontal direction, and is kept in place by the outer door when the box is closed. The dials shown in Figs. 1 and 2 are pivoted at the top and bottom to this auxiliary door, and are easily turned when it is opened. With this construction it will be seen that the contents of the box are readily taken from it and the dials adjusted as desired. The excellence of the construction and workmanship are alluded

meeting edges of the respective rails. It is so constructed that when the eccentric cam is by its handle turned half way round it will engage the lip on the locking plate, and the motion of the handle being continued the sashes are locked tight together. The cam point is so constructed as to engage the locking plate, even if the upper sash is somewhat below its proper level, the rise of the cam gradually raising the sash as the cam is turned. The connection between the cam and the handle is made by a post formed on the handle and clenched so as to be flush with the bottom of the cam. The handle is furnished with or without an automatic latch, not represented in the cut, which gives security against its being opened from the outside. In alluding to the advantages possessed by this sash lock reference is

Foreign Markets.

EQUIVALENTS

	Cents.
Franc. Peso or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	39.0
Milreis (Portugal)	\$1.8
Milreis (Brazil)	54.6
Mark (Germany)	.23.8
Kilogram	Pounds.
	220.5
Picul	134.

GREAT BRITAIN.

FOREIGN WIRE AND GALVANIZED IRON.

In their annual circular Brooker, Dore & Co., of London, say:

Fencing Wire.—In the spring of the year English makers were badly off for orders, and as low a price as £6. 10/- was accepted for Drawn Annealed Wire, No. 8, in April; since then there has been more business doing, and prices have hardened. We now quote £7 @ £7. 2/6, f.o.b. London. It is rumored that negotiations are proceeding with a view to bring about an international syndicate between the English and Continental makers, having for its object the controlling of output and arranging a uniform price. We scarcely believe, however, in the practicability of such a scheme. The shipments to Australia and New Zealand for the past 10 years have been as under:

	Tons.	Tons.	
1878.	29,937	1883.	26,007
1879.	18,294	1884.	22,199
1880.	21,540	1885.	28,979
1881.	38,337	1886.	20,765
1882.	50,199	1887.	22,086

Galvanized Iron.—During the first four months of the year the demand fell off and prices declined; but during May a better feeling began to prevail. We then gave it as our opinion that a recovery was almost certain before the autumn, and that in all probability a reaction would set in earlier than it did in 1886. The course of the market proved that we were right in our anticipation, and by the beginning of July some makers were already obtaining 5/- advance. Since then the rapid rise in Spelter, together with the advance in Sheets, has, of course, necessitated corresponding advances in the price of Galvanized Iron, which shows a rise altogether of about £3 @ £3. 10/- per ton. The shipments show a considerable increase upon any previous year, in addition to which there has been a marked improvement in the home demand. The shipments to Australia and New Zealand from 1877 are as follows:

	Tons.	Tons.	
1877.	27,270	1883.	50,275
1878.	30,370	1884.	53,685
1879.	22,500	1885.	63,233
1880.	28,015	1886.	45,176
1881.	40,113	1887.	57,976
1882.	45,725		

STEEL RAILS,

to the extent of nearly 8000 tons, are asked for by the South Indian Railway. Among the business openly done during the week is the lot of 10,000 tons required by the Great Eastern Railway Company, which has been divided by the Ebbw Vale Iron and Steel Company, Limited, and Charles Cammell & Co., Limited. The former firm are believed to have made their contract at about £4. 8/- per ton delivered at Lowestoft, and the latter at about £4. 10/- per ton delivered at March. The Great Northern lot of 10,000 tons has, it is understood, been divided, Samuel Fox & Co., Limited, having secured 5000 tons, and Charles Cammell & Co., Limited, and Steel, Peech & Tozer the other half between them. It is believed that the price obtained is about £4. 10/- delivered at Retford or Doncaster.—*Ironmonger*, January 28.

LONDON IVORY SALE.

At the quarterly sale which has been held this week, the total quantity offered was 11½ tons, or 10½ tons below the average supply to the first season of sales for the previous 25 years, and 8½ tons below the average quarterly supply for the whole of that period. The quantity of East Indian kinds was larger than that catalogued in any first series of sales since 1874, and was 8 tons in excess of the quarterly average. The proportion of Egyptian has not been exceeded since the closing sales of 1885, but it was far below an average, while that from the West African coast falls considerably short of what in recent years has been received, though it was in excess of quarterly average by 3½ tons. The quantity of seahorse was greater than has ever been known before and that of waste and rejections unduly large. The appearance of the show was, on the whole, good. The East Indian, &c., descriptions embrace a large proportion of choice lots of large tusks and billiard-ball ivory, and only a small quantity

of really inferior. The Egyptian was mainly of the Tripoli character, and much of it of soft grain and rather superior quality. The West Coast consists chiefly of Angola and Niger, with rather more of the Bathurst and white-coated sort than usual, but only a very small quantity of coarse. The Cape was too small in quantity to call for notice. Seahorse and walrus, also the mammoth, were up to the average. The range of prices for common to fine qualities of the kind used in Sheffield, generally stated, realisted up to Thursday night as follows: Zanzibar, Bombay, Quillimane and Mozambique hard-grain tusks, £42 @ £50; points and tips, £32 @ £38; scrivelloes, 4 lb to 10 lb, £23 @ £36; West Coast of Africa, fair to fine qualities, tusks, £40 @ £53; scrivelloes, 4 lb to 11 lb, £25 @ £39. Egyptian hard-grain middling to good cracked tusks, £28 @ £39; scrivelloes, 3 lb to 10 lb, £18 @ £28. The competition of Sheffield buyers was keen, but without undue excitement.—*Ironmonger*, January 28.

NORTH OF ENGLAND AND CLEVELAND.

The Pig-Iron market this week has, on the whole, been in a more favorable state than has been reported since before Christmas; the dullness which has recently affected it seems to be passing away to some extent, and the downward tendency of prices appears to have been checked. Consumers and merchants, it is true, are not yet much readier about buying than they were last week, but there is this satisfactory feature to be noted—those speculators who bought heavily during December, when everything gave promise of being so rosy, and determined to sell out early this month, when they found that the progress was not made which they expected, are not nearly so anxious to get rid of their Iron, and exhibit more confidence in the future; they now see that there was no good reason for pressing upon the market the Iron they bought last month, and that their action has only resulted in loss to themselves, for it has forced down the prices, and they have had to take considerably less for their Iron than they gave for it. Some of the speculators are said to have been heavy sufferers by their operations during the last two months, which some might have avoided if they had only possessed the virtue of patience. Makers' Iron, both in their own and merchants' hands, has been very steady in price during the last two weeks, keeping at about 32/- per ton for prompt f.o.b. deliveries of No. 3 G.M.B., and the fluctuations have been altogether in warrants, which have been ruled by the course of the market at Glasgow. That usually affects the market generally in this district, but has not had so much influence this week. It is not likely that there will be any great variation in prices for the next few days, at any rate not till the month is closed, though the tendency will, if anything, be toward ease, because there are still some speculators who have to take up Iron this month, and who are not in a position to accept delivery themselves or to put it into the stores; they will, therefore, have to sell at whatever price they can get, and merchants take advantage of their difficulties to pick up cheap lots. A good deal of speculating was done last month by people outside the trade, who, when the market goes against them, have to sell in the open market, as they do not know the consumers to whom they might dispose of the Iron; and, besides, if they found consumers, might not be able to sell on the terms generally required by the buyers—viz., cash on 10th of month following delivery, or by bill—especially as they themselves have to pay the makers cash on Monday following delivery. They, therefore, must sell to some one who will pay them ready money for the Iron, and to effect such sales they have to take less than the current market prices; but their transactions are cited as examples of the figures at which business is done, and this depresses the market. Such a state of affairs is only what is usual toward the end of a month, but after a period of speculative buying such as we have had in December, such forced realizations are much more numerous.—*Iron and Coal Trades Review*.

The iron trade does not exhibit the recuperative power which the marked improvement in December warranted us to expect; still there is a strong undercurrent of hope and a general belief that the better times will not be short-lived. The Steel trade is in a most healthy state, and manufacturers are full to the hilt with orders. Prices are strong for all kinds of Steel except Rails. We expect to see the price of Rails advanced, as there are several inquiries of an important nature floating about, which should give the needed impetus when placed. The lack of buoyancy in the Pig-Iron market is attributed to different causes, but the decrease in the shipments to America is the most potent cause of weakness in prices. There has also been a great falling off in the shipments to Italy. The shipments of machinery are, however, large, which accounts for the increased activity among the engineers. Quite a spurt of business has manifested itself for foreign requirements, and our correspondents

in South America, Australia and Spain all report that the demand in 1888 will be much in excess of recent years. The most satisfactory evidence of the improvement in trade is to be found in our reports from all quarters, coupled with the fact that the upward tendency is slow and therefore sure to last, and not turn out a mere "flash in the pan."

Scotland.—The dull feeling which prevailed on the Glasgow warrant market last week has been removed, and a firmer tone has operated throughout the present week. The telegrams which we were able to give on Friday evening last indicated that Steel Rails and Pig Iron were likely to be admitted free to America, and this report had the effect of strengthening the Scotch market at the opening of this week. The business done has been above the average, but the speculators are quiet. Sellers are not pressing their Iron, which may be taken as an evidence of their confidence in the future. At the Malleable Iron Works considerable briskness reigns. The Steel and Tube makers have their hands more than full, and the future for all the Iron and Steel industries around the basin of the Clyde is full of promise.

Wales.—The Iron, Steel and Coal trades in Wales are on the move upward, and the firmer feeling is produced by increased inquiries and some heavy orders. The Rail mills are well employed and the Steel makers generally busy. The coalition between the syndicate of capitalists and Tin-Plate manufacturers has not been confirmed. The output of Tin Plates is large, and from Swansea alone nearly 70,000 boxes were shipped last week. Three shipments of Steel Rails were sent out this week from Wales to South America.—*Iron and Steel Trades Journal*, January 28.

CHILI.

VALPARAISO, December 9, 1887.—*Copper*—In response to the rise in England, the price has improved from \$23.45 @ \$27.90 per quintal good ordinary brands, the advance being neutralized in part by the rising freight and exchange. A large business has been done, sales amounting to 50,355 quintals, comprising the greater portion of what will be produced to the end of March. The price of \$27.85 equals £60. 17½ per ton f.o.b., with freight 30/- per steamer to Liverpool. *Nitrate*.—Hardly anything has been done beyond 28,000 quintals, December and January shipment per steamer. There are still a few cargoes available for December shipment held at \$2.65 for 95% with 30/- freight; nothing can be procured of January to April deliveries at anything near this price. For February to March 8½ has been offered in vain for 95%. The market closes nominally at \$2.60, which equals 7½ per cwt., with 25/- freight to England. There have been shipped in November to Europe 140,000 tons, and to the United States 2000 tons; there were loading on the 1st inst., respectively, 85,000 tons and 11,500. Chartered during the last fortnight 16,200 for Europe, and 3400 for the United States. *Coal* is in good demand and little of it arriving; quotations are unchanged. *Exchange*, 25½d.—*Weber & Co.*

ECUADOR.

GUYAQUIL, January 1, 1888.—*Ivory Nuts*.—There are none in the market; nominal quotations continue at \$2 per quintal on shore, which corresponds at an exchange of 62% to 7½ per cwt. f.o.b. at Guyaquil, inclusive of bags and commission. There have been no shipments by sail during December, although several vessels are loading. Total shipments by sail during 1887, 258,125 quintals, as compared 179,808 in 1886, 169,000 in 1885 and 107,759 in 1884. Loading to-day 2165 tons, against 1733 the previous year and 1276 on January 1, 1886. *Exchange* on New York, 30 days' sight, 38½% premium.—*O. Wolfram & Co.*

EAST INDIES.

MANILA, January 16, 1888.—*Hemp*.—Fair current is quoted at the parity of £31. 6/- cost and freight for England as compared with £30. 5/- week ago. Total receipts since January 1, 13,000 bales, shipments to England per steamer 9000 bales; to the United States, 6000, to other countries 1000. Loading for England per steamer 2000, for the United States 13,000. Freight £3 per ton to England. *Exchange*, six months' sight on England, 3/8.—*Smith, Bell & Co.*

SINGAPORE, February 1, 1888.—*Tin*.—Shipments in January have been 400 tons to the United States and 3500 to England; last year they were respectively, 550 and 700.—*Giltinan, Wood & Co.*, per cable to *Charles Nordhaus*.

SPAIN.

BILBAO, January 14, 1888.—*Iron Ore*.—Several sales have been made during the week, but none of them of importance; prices have been within the range of 6/10 @ 7/3 for Rubios and 7/6 @ 8/ for Campanil. Shipments have summed up a fair amount, the total since January 1st being 118,884 tons; 115,136 same

time last year. Nothing has been done in *Pig Iron* for export, while coastwise 800 tons have been shipped. During last year the three works here, the Altos Hornes, the San Francisco and Vizcaya, have, taken together, consumed 600,000 tons of Iron Ore. The Altos Hornes, in its Bessemer Steel works, foundries, &c., employs over 1000 operatives, and uses nearly all its own Pig Iron. The San Francisco merely turns out Pig Iron to a large amount, and the Vizcaya, besides the 300 tons of Pig Iron which it produces daily, will in future make its own Coke in the Carvés furnaces which have just been finished. In the latter works Siemens-Martin Steel works will soon be erected. The export of Pig Iron from Bilbao is getting more important every year; and besides the countries and markets which Bilbao furnishes with it currently, La Vizcaya has delivered large amounts for Russia and the United States in 1887. This preference which is given to Bilbao Pig Iron arises from the fact that the Bilbao Hematites, manufactured exclusively from Bilbao Ores, are always purer than the Hematites made from mixtures of Ores from different countries.—*Bilbao Marítimo y Comercial*.

ROUMANIA.

BUCHAREST, January 21, 1888.—Quicksilver.—An English company has been formed for the mining of Quicksilver near Belgrade, and the results are so favorable that the house of Rothschild has made very favorable offers to buy out the concern. It will be remembered that the Rothschilds are under contract with the Spanish Government for the Almaden mines in Spain for many years past, and that if such a firm makes an offer in the same line of business elsewhere it must have good reasons for so doing.—*The Roumanian Lloyd*.

GERMANY.

HAMBURG, January 28, 1888.—Iron.—The market remains in good position in Rhenish-Westphalia. Prices without an exception are well sustained, and in most cases show a rising tendency. The inquiry, on the whole, is very active, works are for the most part satisfactorily engaged; hardly any complaint is heard in any branch. Quite a demand has been noticeable for Pig Iron, which is stiff, in view of the strong market for Iron Ore; in fact, prices have been improving so fast that makers of Finished Iron find it difficult to get a corresponding advance in what they turn out. Spiegel is bringing 52 @ 53 marks, with 10% to 12% manganese. Forge Pig continues in lively request upon the strength of large orders received by the rolling mills. Some orders were received by the latter all the way to the middle of May. There is great anxiety to buy for the second quarter of the year. Prime quality of Forge Pig is quoted 50 @ 51 marks $\frac{1}{2}$ ton, and in some instances 51.50 has been submitted to. White Pig is held at 51. The price of Luxembourg finished has been raised 4 francs, so that it cannot be had now for less than 47 francs. Foundry Pig, as a general thing, moves off tolerably well at figures fixed by the syndicate. The quotation ranges between 50 and 57 marks. It seems that a lively demand has been kept up latterly for Bessemer Pig and prices have remained firm. Thomas is unaltered at 44; Merchant Iron is doing tolerably well, there being a good inland demand, but hardly any for export. Hoops have been in moderate request, yet prices have been sustained. Boiler Plates have been doing exceptionally well, giving occasion for a slight raising of prices. Wrought Iron has also met with a better inquiry. Manufacturers of steam boilers have received good many new orders, leaving a good margin—the fact is, that a good many engines are being mounted in various directions. Thin Sheets are also wanted to some extent, though not quite as much as during last fall. There have been no further adjudications on railroad cars, but some are expected. We quote Steel Billets, 135 marks; Wire Rods may be quoted 115 @ 116; Wire Nails, 145 @ 150. Machine shops and foundries are, on the whole, satisfactorily booked, but prices might be higher. It should be remarked that the demand for Iron and Steel for shipbuilding is noted to be rather on the increase latterly; there is some hope that in this direction more will be done in the future and that prices will stiffen accordingly. **Metals.**—Lead was firm but quiet; Copper as firm as ever, and Spelter, quiet, but firm.—*Borsenhalle*.

FRANCE.

PARIS, January 28, 1888.—Metals.—Since our last report our market has been quiet and steady at the ensuing quotations in francs. $\frac{1}{2}$ 100 kg.: Copper, Chili Bars, 210 @ 215; Ingots and Slabs, 200; Best Selected, 205; Tin, Banca, 430; Billiton, 420; Straits, 410, and English, 385.50; Lead, 39 @ 40, and Spelter, 55.50 @ 57. **Iron.**—During the week under review there has been a general rise in France, Merchant is now quoted in the Northern Department at 13 francs $\frac{1}{2}$ 100 kg., in this city 14.50,

while beams are bringing 12 francs at the North and 13.50 here. In this manner the equilibrium has been restored between the prices charged by makers and by dealers. The only people complaining are the consumers in this city who have hitherto been buying cheaper than they would otherwise have been able to do. It is now seen what sacrifices the rolling mills of the North have had to submit to in order to avoid stopping work altogether or accumulating stocks to await the pleasure of dealers. In the Meurthe-et-Moselle prices are also high; Forge Pig has been raised to 4.60, and Foundry Pig No. 3 now commands 5.80 @ 6 francs in that locality. The French Steel Works have just bought of the Western Railway 4000 tons of Old Rails for 80 francs $\frac{1}{2}$ ton—this is considered a high price. The last report obtained from the Fives-Lille Company proves that the sacrifices it recently made in order to get into the Chinese and Japanese business begin to produce results. Since March, 1887, Fives-Lille has delivered several bridges, and is now building two large dredges for China. As for Japan, the company is about to receive some important orders.—*Moniteur des Intérêts Matériels*.

AUSTRIA.

VIENNA, January 24, 1888.—Iron.—Business in the Iron lines in Austria-Hungary has been hampered by the extreme severity of the winter we have had, disturbing even the locomotion by rail, owing to a heavy snowfall. Pig Iron has been inanimate on the spot, but for forward delivery a good demand has been gradually growing up, extending to all leading articles in the Iron line. Old Rails have been in active demand and rising. We quote nominally today in florins, $\frac{1}{2}$ ton, 40 @ 47; Merchant Iron, 105 @ 120; Sheets, 145 @ 175; Galvanized Sheet Iron, 255 @ 310, and Beams, 120 @ 125. **Metals.**—The metal market has quieted down. We quote at the close: Copper, 109; Lead, 24; Spelter, 29; Tin, 201 @ 202; Antimony, 56, and Quicksilver, 250 florins $\frac{1}{2}$ 100 kg.—*Handels-Journal*.

BELGIUM.

BRUSSELS, January 28, 1888.—Iron.—Our market has remained in an anomalous condition. On the one hand Pig Iron is still scarce and held high, and on the other hand it is difficult to meet the views of exporters of Beams, Angles and Merchant Iron. It is true some orders are still being received from Italy, but this may drop off at any moment, and besides we have to meet French competition in this item. Meanwhile it is to be hoped that the blowing in of more blast furnaces at Charleroi will furnish us with a better supply of Pig Iron. The price during the week of common Forge Pig has been 4.50 at Liège and 4.60 at Charleroi. Athus declines to sell any further at 4.50 for the second quarter. As for Foundry Pig, it has stiffened likewise and cannot be had for less than 4.80 @ 4.90. There is a good prospect of extensive adjudications of rolling stock, both cars and locomotives, which the Government and branch railroads are in need of. The increase in the manufacture of Thomas Steel for the fiscal year ended October 31st is best shown by referring to the table below:

	Total 1885-1886.	Total 1886-1887.	
	Of which	Of which	
	with 0.17	with 0.17	
	carbon.	carbon.	
Tons.	Tons.	Tons.	Tons.
England.....	258,466	161,908	364,526
Germany, Austria.....	883,859	651,528	1,102,496
Luxembourg, France.....	122,711	77,141	174,271
Belgium and other c'ntr's	48,595	36,712	60,959
Total.....	1,313,631	927,284	1,702,252
			1,222,732

Moniteur Industriel.

A decision of considerable interest to consumers of natural gas was rendered in the courts of Beaver, Beaver County, Pa., last week. From the facts in the case it appears that the Citizens Gas Company were supplying gas to the Rochester Flouring Mills Company, a few miles from Beaver Falls, and that owing to a shortage in the supply the company notified their patron that the gas would be shut off in a short time until the supply should increase. The party receiving the notice at once applied for an injunction to restrain the gas company from taking this action. A preliminary injunction was granted, and on the case coming to trial the presiding judge dissolved the injunction, on the ground that the company proved that a temporary scarcity of gas existed, and that their patrons are classified as to the preference in the use of gas. The rules classifying patrons read as follows: "Should the

supply of gas at any time become short from any cause, dwelling houses and stores shall always have the preference, glass-works next, potteries next, and all other works next, the last mentioned being first to be shut off when necessary, respect being had to the date of contract in several orders. In case firms are shut off for want of supply, preference will always be given, where it can be done, to the firms having the most economical appliances, pressures and machinery and firms which use the gas in the most economical manner." In rendering his decision the judge stated that the gas company had a perfect right to thus classify their patrons, and that when they find it impossible to supply all without detriment to others it is permitted to discontinue the supply to patrons in a less preferred class, in order to keep up the supply to the preferred class.

A Large Universal Mill.

Mackintosh, Hemphill & Co., Limited, of Pittsburgh, manufacturers of rolling mill machinery, steel castings, &c., are completing a machine that is the largest of its kind in this country, if not in the world. It is a universal mill for Carnegie, Phipps & Co., Limited, and is intended for the new works which that firm are building at Homestead, Pa. Mr. Mackintosh, of the first-named firm, has furnished the following particulars regarding the new mill:

It is the design of Julian Kennedy, and was to be known as a plate-slab mill, and was also to be sufficiently large to roll armor plates. Four rolls, two vertical and two horizontal, will be used. The vertical rolls are made of cast steel, and are 22 inches in diameter. The horizontal rolls are much larger, being 32 inches in diameter, and each will weigh 22,000 pounds, being what are known as chilled rolls. These horizontal rolls will be faced so that a plate 53 inches wide can be rolled by them. The pinions are 40 inches in diameter, and are made of cast steel, weighing about 17,000 pounds each.

The housings are somewhat larger than usual in such mills. They are cast of iron, and two of them for the rolls weigh 70,000 pounds each, and two smaller ones 60,000 each. The housings for the pinions each weigh 30,000 pounds. A steel spindle, a model in its way, which will connect the pinions with the rolls, is about 16 feet in length and 18 inches in diameter. It weighs only 12,000 pounds, being ribbed out to save weight. The total weight of the mill is 835,000 pounds, or 417.5 tons of 2000 pounds. Of this immense amount of metal 215,000 pounds, or 107.5 tons, are of steel castings, making this machinery the largest in the world. The ingots to be rolled on it will weigh from 40 to 50 tons each, and the tables on each side, being made by the Keystone Bridge Company, will have 20 rollers each, both tables weighing about 400,000 pounds, or 200 tons. The mill was partially erected in the works a short time ago, and found to be very satisfactory.

The engines for this mill are being made by a Milwaukee firm, and are nearly completed. There will be two pairs of compound reversible engines. The larger one will be used to drive the horizontal rolls, and the cylinders will be 42 inches in diameter by 52 inches stroke. These will be placed at one end of the rolls, while at the other end the smaller engines, to drive the vertical rolls, will be placed. These cylinders will be 32 inches in diameter by 54 inches stroke, and to furnish steam for both will require a battery of about 12 two-flue boilers of standard size. It is the intention of Carnegie, Phipps & Co., Limited, to have the mill in operation by April. Many workmen are employed setting up the machinery.

CURRENT HARDWARE PRICES.

FEBRUARY 8, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Ferocious, # 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	.50@
E. B. Trimmed Edge, 1-10's.....	.65@
E. B. Ground Edge, Central Fire, 1-10's.....	.70@
Double Waterproof, 1-10's.....	.81@
Musket Waterproof, 1-10's.....	.52@ .53@
G. D.28@
S. B.30@
Union Metallic Cartridge Co.	
F. C. Trimmed.....	.50@
F. L. Ground.....	.65@
Cen. Fire Ground.....	.70@
Double Waterproof.....	.81@
Double Waterproof, 1-10's.....	.81@
S. B. Genuine Imported.....	.45@
Eley's E. B.54@ .56@
Eley's D. Waterproof, Central Fire.....	.81@

Cartridges.

rim Fire Cartridges.....	.dis 50@52@
rim Fire Military Cartridges.....	.dis 15@2@
Cen. Fire Cartridges, Pistol and Rifle.....	.dis 25@5@2@
Cen. Fire Cart., Military & Sporting.....	.dis 15@5@2@
Blank Cartridges, except 22 and 32 cal., an additional 10 @ over above discounts.	
Blank Cartridges, 22 cal.....	.dis 1.75, dis 2@
Blank Cartridges, 32 cal.....	.dis .35@
Primed Shells and Bullets.....	.dis 1.75, dis 2@
B. B. Caps, Round Ball.....	.dis 1.75, dis 2@
B. B. Caps, Conical Ball, Swaged.....	.dis .20, dis 2@

Primers.

Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells).....	.dis 1.00, dis 2@
All other Primers, all sizes.....	.dis .10, dis 2@

Shells.

First quality, 4, 8, 10 and 12 gauge.....	.dis 25@10@2@
First quality, 14, 16 and 20 gauge (\$10 list).....	.dis 20@10@2@
Star, Club, Rival and 10-gauge, \$9 list, dis 23@10@2@	
Climax Brands, 12-gauge, \$8 list.....	.2%
Club, Rival and Climax Brands, 14, 16 and 20 gauge.....	.dis 30@10@2@
Selbold's Combination Shot Shells.....	.15@2@
Brass Shot Shells, 1st quality.....	.dis 60@2@
Brass Shot Shells, Club, Rival & Climax.....	.dis 65@2@

Shells Loaded.

List No. 19, 1887.....	.dis 20 & 10 %
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Wads.

O. M. C. & W. R. A.—B. E., 11 up.....	.20@
O. M. C. & W. R. A.—B. E., 9@10.....	.20@
O. M. C. & W. R. A.—B. E., 7@8.....	.20@
O. M. C. & W. R. A.—B. E., 11 up.....	.20@
O. M. C. & W. R. A.—P. E., 9@10.....	.40@
O. M. C. & W. R. A.—P. E., 7@8.....	.40@

Eley's E. B. 11 up.....

Eley's E. B. 11 up.....	.1.75
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Eley's P. E. 11 @ 20.....

Eley's P. E. 11 @ 20.....	.20@
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Anvils.—Eagle Anvils.....

Wright's.....	.dis 10@
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Armitage's Mouse Hole.

Armitage's Mouse Hole, Extra.....	.9@
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Trenton.

Wright's Patent Solid.....	.9@
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Smith & Rice's Patent Solid.

Miller's Fulls Co.....	.18.00, dis 20@
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Chenow Anvil and Vise.

Allen Combined Anvil and Vise.....	.dis 40@10@
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Moore & Barnes Mfg. Co.

Moore & Barnes Mfg. Co.....	.dis 33@5@
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Augers and Bits.

Douglas' Mfg. Co.....	
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New Haven Copper Co.

Wm. A. Ives & Co.....	.dis 70@70@5@
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Humphreysville Mfg. Co.

French, Swift & Co. (F. H. Beecher)	
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Connecticut Valley Mfg. Co.

Cook's, New Haven Copper Co., dis 50@10@50@8@10@5@	
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Ives' Circular Lip.

Patent Solin's Head.....	.dis 60@
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C. E. Jennings & Co., No. 10, extension tip.

C. E. Jennings & Co., No. 10, extension tip.....	.dis 40@
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C. E. Jennings & Co., Auger Bits, in fancy boxes.

* see 32@ quarters, No. 5, 45; No. 30, 45; No. 20, 20@	
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Lewis' Patent Single Twist.

Russell Jennings' Augers and Bits.....	.dis 25@
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Imitation Jennings' Bits, new list.

dis 60@ 6.5@	
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Pugh's Black.

dis 20@ 1.60@	
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Car Bits.

L'Hommedieu Car Bits.....	.dis 15@10@
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Forster Pat. Auger Bits.

dis 10@	
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Hollow Augers—Ives.

French, Swift & Co.....	.dis 25@10@
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Douglas'.

Bonney's Adjustable # doz. \$48.....	.dis 40@10@
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Stearns'.

dis 20@10@	
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Ives' Expansive, each \$4.50.

Universal Expansive, each \$4.50.....	.dis 20@
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Wood's.

dis 25@ 25@10@	
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Expansive Bits.

Clark's small, \$18; large, \$30.....	.dis 35@ 35@
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Ives' No. 4, per doz. \$60.

dis 35@ 40@	
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Swan's.

dis 40@	
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Steer's, No. 1, \$26; No. 2, \$22.

dis 35@	
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Stearns' No. 2, \$18.

dis 35@	
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Common Bits.

Pat. gross \$2.75 @ \$3.25	
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Diamond.

Pat. gross \$1.10, dis 25@ 25@	
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"Bee."

Double Cut, Shepardson's.....	.dis 45 @ 45@5@
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Double Cut, C. T. Valley Mfg. Co.

Double Cut, Hartwell's, \$1 gro.	.dis 45@
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Double Cut, Douglass'.

dis 40@ 10@ 10@	
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Double Cut, Ives'.

dis 40@ 10@ 10@	
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Bit Stock Drills.

Morse Twist Drills.....	.
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February 9, 1888.

Best Anti-Friction.	dis 60 1/2
Duplex (Wood Track).	dis 60 1/2
Terry's Patent.	* doz pr. \$4 in. \$10 5 in. 11 1/2
Cronk's Patent.	No. 4, #12; No. 5, #14 40; No. 6, #18 1/2
Wood Track, Iron Clad.	* ft. 10¢ dis 50 & 10 @ 50 & 15 1/2
Architect.	* set \$6.00; dis 20 1/2
Eclipse.	dis 50 @ 50 & 15 1/2
Felix.	* set \$4.50; dis 20 1/2
Richards'.	dis 30 @ 30 & 10 1/2
Lane's Steel Anti-Friction.	dis 20 & 10 @ 25 & 10 1/2
The Ball Bearing Door Hanger.	dis 20 & 10 @ 25 & 10 1/2
Warner's Patent.	dis 20 & 20 @ 10 1/2
Stearns' Anti-Friction.	dis 20 & 20 @ 10 1/2
Stearns' Challenge.	dis 25 & 10 @ 25 & 10 1/2
Fagittless.	dis 40 & 40 @ 25 & 10 1/2
American.	* set \$6.00; dis 20 1/2
Elder & Wooster, No. 1, #24; No. 2, #75.	dis 40 1/2
Paragon, Nos. 1, 2 and 3.	dis 40 & 10 1/2
Paragon, No. 5, #34, 7 and 8.	dis 20 & 10 1/2
Crane.	dis 40 @ 60 & 10 1/2
Nickel, Cast Iron.	dis 50¢
Nickel, Malleable Iron and Steel.	dis 40 1/2
Harness Snaps. —See Snaps.	
Hatchets. —List Jan. 1, 1886.	
Isiah Blood.	dis 35 @ 40 1/2
Hunt's Shingling Lath and Claw.	dis 40 & 5 1/2
Hunt's Broad.	dis 40 1/2
Buffalo Hammer Co.	dis 40 & 10 @ 50 1/2
Hurd's.	dis 40 & 20 @ 40 & 25 1/2
Yerkes & Plumb.	dis 40 & 40 @ 40 & 10 1/2
Wm. Mann, Jr., & Co.	dis 50 @ 50 & 5 1/2
Underhill's Edge Tool Co.	dis 40 & 5 @ 40 & 10 1/2
Underhill's Haines and Bright goods.	dis 33 1/2 1/2
C. Hammon & Son.	dis 40 & 10 @ 50 1/2
Simmons.	dis 35 @ 40 1/2
Pec's.	dis 40 & 10 @ 40 & 25 1/2
Kelly's.	dis 50 @ 60 & 5 1/2
Sargent & Co.	dis 50 1/2
Ten Eyck Edge Tool Co.	dis 40 & 10 @ 40 & 25 1/2
Collins, following list.	
Shingling, No. 1 2 3.	* doz \$5.50; \$6.00; \$6.50
Claw.	* doz 6.00; 6.50; 7.00
Lathing.	No. 1 2 3. * doz 5.50; 6.00
Hay Knives.	
Lightning.	Mfrs. price * doz \$18
Electric.	dis 25 1/2; Joober's Extras * doz 18; * 1/2; dis 10 1/2
Gem.	* doz \$18 1/2 30 & 5 1/2
Wadsworth's.	dis 40 & 7 1/2 @ 40 & 10
Carter's Needle.	* doz \$11.50 @ \$12 1/2 0
Heath's.	* doz \$13.50 @ \$14.00
Hinges.	
Wrought Iron Hinges.	
Str. in T.	dis 70 & 5 @ 70 & 10 1/2
Screw Hook and S. 10, 12 in. * D.	34 1/2
Strap.	14 to 36 in. * D. 24
Heavy Welded Hook	{ 8 to 12 in. * D. 34 1/2
Screw Hook and Eye.	{ 8 in. * doz \$1.50 { 10 in. * doz \$2.45 { 10 { 12 in. * doz \$3.80 { 12
Rolled Blind Hinges, Nos. 32 and 34.	dis 50 1/2
Rolled Blind Hinges, Nos. 232 and 234.	dis 55 1/2
Rolled Plate.	dis 70 1/2
Rolled Raised.	dis 70 1/2
Plate Hinges { 8, 10 & 12 in. * D.	4 1/2
"Providence" over 12 in. * D.	34 1/2
Spring Hinges.	
Geer's Spring and Blank Butts.	dis 10 1/2
Union Spring Hinge Co.'s list, March, 1886.	dis 20 1/2
Acme, Crown, Empire and U. S.	dis 30 1/2
American, Gem, and Star, Jappanned.	dis 20 1/2
Oxford, Bronze and Brass.	no 1
Barker's Double Acting.	dis 20 & 10
Union Mfg. Co.	dis 25
Bommer's.	dis 30
Bucman's.	dis 15 & 20 1/2
Chicago.	dis 30 1/2
Gate Hinges.	
Western.	* doz \$4.40, dis 5 1/2
N. E.	* doz \$7.00, dis 6 1/2
N. E. Reversible.	* doz \$5.20, dis 5 1/2 & 10
Clark's, No. 1 2 3.	dis 60 & 10 @ 60 & 10 1/2
N. Y. State.	* doz \$5.00, dis 5 1/2 & 10
Automatic.	* doz \$12.50, dis 50 1/2
Common Sense.	* doz pair \$4.50, dis 50 1/2
Seymour's.	dis 45 & 10 1/2
Shepard's, Nos. 1, 2, 10 and 20.	dis 60 & 10 @ 60 & 10 1/2
Shepard's, No. 3.	dis 60 & 10 @ 60 & 10 1/2
Reed's Latch and Hinges.	* doz sets \$12, dis 50
Bind Hinges.	
Parker.	dis 75 1/2
Palmer.	dis 50 & 25 & 10
Seymour.	dis 70 & 2
Nicholson.	dis 45 & 10 & 1
Huffer.	dis 50 1/2
Clark's, Nos. 1, 3, 5, 40 and 50.	dis 75 & 10 & 50 1/2
Clark's Mortise Gravity.	dis 50 1/2
Sargent's, Nos. 1, 3, 5, 11, 13.	dis 75 & 10 @ 75 & 10 1/2
Sargent's, No. 12.	dis 75 & 10 & 10 1/2
Reading's Gravity.	dis 75 & 10 @ 75 & 10 1/2
Shepard's "Noiseless."	Nos. 50, 60, 65 55.
Shepard's Niagara Gravity.	Nos. 1, 3 and 5.
Shepard's Buffalo Gravity.	Nos. 1, 3 and 5.
Shepard's Champion Gravity No. 75.	dis 80 & 21 1/2
Shepard's Steamboat Gravity.	dis 80 & 10 1/2 5
Shepard's Acme Lull & Porter.	dis 80 & 20 1/2
Shepard's S. Lull & Porter.	dis 75 & 5 @ 75 & 10
Shepard's "Queen City" Reversible.	dis 70 & 10 1/2
Clark's Lull & Porter.	Nos. 1, 1 1/2, 2, 2 1/2
North's Automatic Bind Fixtures.	No. 2 for Wood, \$10.50; No. 3 for Brick, \$13.50. dis 25 & 2
Hoes.	
Handled.	
Garden, Mortar, &c.	dis 65 & 25 1/2
Planter's Cotton, &c.	dis 65 & 25 1/2
Warren Hoe.	dis 60 1/2
Magic.	* doz \$4.1/2
Hoys.	
D. H. Scovil.	dis 15 1/2
Lane's Crescent Scovil Pattern.	dis 16 1/2
Lane's Razor Blade, Scovil Pattern.	dis 45 & 10
Maynard, S. & O. Pat.	dis 45 & 5
Sandusky Tool Co.	dis 60
Hubbar & Co.	dis 60
Bare.	dis 60
Grub.	dis 60 @ 60 & 10
Hog Rings and Ringers.	
Hill's Improved Ringers.	* doz 15.50 @ 5 1/2
Hill's Old Style Ringers.	* doz \$3.00 @ 3 1/2
Hill's Tonga.	* doz 5.50 @ 6.00
Hill's Rings.	* doz boxes \$2.00 @ 2.25
Perfect Kings.	* doz boxes \$1.75 @ 2.00
Perfect Ringers.	* doz \$2.50
Blair's Hog Ringers.	* doz \$2.60
Blair's Hog Rings.	* doz 95¢ @ \$1.00
Champion Ringers.	* doz \$1.50 @ 5 1/2
Champion Rings, Double.	* doz \$2.25
Brown's Ringers.	* doz \$2.00
Brown's Rings.	* doz 1.25 @ 1.50
Hoisting Apparatus.	
"Moore's" Hand Hoist, with Lock Brake.	dis 15
"Moore's" Differential Pulley Block.	dis 20
Holders, Tool.	
Balz Pat.	* doz \$4; dis 25
Hollow-Ware.	
Iron.	
Stove Hollow-Ware, Ground.	dis 60 & 10 @ 60 & 10 1/2
Stove Hollow-Ware, Underground.	dis 70 & 10 @ 70 & 10 1/2
Enamelled and Tinned Hollow-Ware—	
Kettles.	
Oval Boilers, Saucepans & Glue Pots.	dis 70 & 10
Gray Enamelled Ware.	dis 40 & 10 @ 40 & 10
Agate and Granite Ware.	dis 10 @ 40 & 10
Rustless Hollow-Ware.	dis 50 @ 50 & 10
Galvanized Tea-Kettles—	
Inch... 6 7 8 9	
Each... 55¢ 60¢ 65¢ 75¢	
Silver Plated.	
Reed & Barton.	dis 40 & 5
Meriden Britannia Co.	dis 40 & 5
Simpson, Hall, Miller & Co.	dis 40 & 5
Rogers & Brother.	dis 40 & 5
Hartford Silver Plate Co.	dis 40 & 5 & 5
William Rogers Mfg. Co.	dis 40 & 5 & 5
Hoops.	
Cast Iron.	
Bird Cage, Sargent's list.	dis 60 & 10 @ 10 1/2
Bird Cage, Reading.	dis 60 & 10 @ 10 1/2
Clothes Line, Sargent's list.	dis 60 & 10 @ 10 1/2
Clothes Line, Reading list.	dis 60 & 10 @ 60 & 10 1/2
Ceiling, Sargent's list.	dis 55 & 10 @ 10 1/2
Harness, Reading list.	dis 55 & 10 @ 55 & 10 1/2
Coat and Hat, Sargent's list.	dis 55 & 10 @ 55 & 10 1/2
Coat and Hat, Reading.	dis 50 & 10 @ 50 & 10 1/2
Wrought Iron.	
Cotton.	* doz \$1.25
Cotton Pot (N. Y. Mallet & Handle Wks.).	* doz 30 1/2
Tassel and Picture (T. & S. Mfg. Co.).	* doz 50 1/2
Wrought Staples, Hooks, &c.	See Wrought Goods
Bench Hooks.	See Bench Stop
Wire.	
Wire Coat and Hat, Gem, list April, 1886.	dis 45 1/2
Wire Coat and Hat, Miles', list April, 1886.	dis 45 1/2
Indestructible Coat and Hat.	dis 45 1/2
Belts.	dis 75 & 10 @ 80 1/2
Grass.	dis 20 & 20 @ 20 1/2
Brush.	dis 55 @ 60 1/2
Whittree—Patent.	dis 55 1/2
Hooks and Eyes—Malleable Iron.	dis 70 1/2
Hooks and Eyes—Brass.	dis 60 & 10 @ 10 1/2
Fish Hooks, American.	dis 50 1/2
Horse Nails.	
Nos. 6 7 8 9 10	
Ausable.	25¢ 26¢ 25¢ 24¢ 23¢ dis 25 & 10 @ 25 & 10 1/2
Clinton.	Fin. 24¢ 25¢ 21¢ 20¢ 19¢ dis 40 & 10 @ 50 1/2
Essex.	24¢ 25¢ 25¢ 24¢ 23¢ dis 25 & 10 @ 25 & 10 1/2
Putnam.	24¢ 22¢ 21¢ 20¢ 19¢ 18¢ dis 50 & 10 @ 25 & 25 1/2
Vulcan.	23¢ 22¢ 21¢ 20¢ 19¢ 18¢ dis 12 & 15 1/2
Northwest.	25¢ 25¢ 25¢ 22¢ 21¢ 20¢ dis 20 & 10 1/2
Globe.	23¢ 21¢ 20¢ 19¢ 18¢ dis 12 & 15 1/2
A. C.	25¢ 23¢ 22¢ 21¢ 20¢ dis 25 & 10 @ 25 & 10 1/2
C. B.-K.	25¢ 23¢ 22¢ 21¢ 20¢ dis 25 & 10 @ 25 & 10 1/2
Champain.	25¢ 26¢ 25¢ 24¢ 23¢ dis 25 & 10 @ 25 & 10 1/2
New Haven.	24¢ 26¢ 25¢ 24¢ 23¢ dis 25 & 10 @ 25 & 10 1/2
Saranac.	23¢ 21¢ 20¢ 19¢ 18¢ dis 40 & 10 @ 10 1/2
Champion.	25¢ 23¢ 24¢ 23¢ 21¢ 20¢ dis 10 & 10 @ 10 1/2
Capewell.	25¢ 26¢ 25¢ 24¢ 23¢ dis 35¢ @ 35 & 10 1/2
Star.	25¢ 26¢ 25¢ 24¢ 23¢ dis 10 & 10 @ 10 1/2
Horse Shoes.—See Shoes, Horse.	
Horse, Rubber, competition.	75 & 10 @ 80 1/2
Standard.	dis 70 & 10 @ 70 & 10 1/2
Extra.	dis 60 & 10 @ 60 & 10 1/2
N. Y. B. & P. Co., Para.	dis 50 & 5 @ 50 & 5
N. Y. B. & P. Co., Extra.	dis 50 & 5 @ 50 & 5
N. Y. B. & P. Co., Dundee.	dis 60 & 10 @ 10 1/2
Ice Picks, Chisels, &c.	
Am. Ice Chisel Pol'd.	* doz \$3.00, dis 20 @ 20 & 5 1/2
National Ice Chisel.	* doz \$2.65, dis 20 1/2
Novo's Ice Breakers.	* doz \$2.25, dis 20 1/2
Daniel's Ring Picks.	* doz \$2.00, dis 15 1/2
Wood Head Picks, Sargent's.	* doz \$1.60, dis 10 & 10 1/2
Iron Head Picks, Sargent's.	* doz \$1.25, dis 10 & 10 1/2
Ice Mallets, Pick in handle.	* doz \$2.00, dis 15 1/2
Ice Axes, Small Cast or Mail.	* doz \$1.25, dis 20 & 10 1/2
Combination Ice Tools.	* doz \$2.00 net
Acme Ice Pick and Tonga.	* gross \$55.00, dis 50 & 10 1/2
Roger's Lightning Ice Chisel.	* gross \$28.50
Ice Tongs.	
Champion, S. S. & Co.	* doz \$4.00, dis 25 & 10 1/2
Family.	* doz \$2.75, dis 26 & 25 1/2
Jack Screws. —See Screws.	
Kettles.	
Brass, 7 to 17 in. * D.	24¢ 25¢ 26¢ 27¢ 28¢
Brass larger than 17 inches, * D.	26¢ 27¢ 28¢ 29¢ 30¢
Enamelled and Tea Kettles.	See Hollow-Ware
Knives.	
Wilson's Putcher Knives.	dis 20 @ 25 1/2
Ames' Butcher Knives.	dis 25 & 10
Nicole's Butcher Knives.	dis 40 & 10
Ames' Shoe Knives.	dis 10 @ 25 1/2
Ames' Bread Knives.	* doz \$1.50, dis 10 & 10 1/2
Moran's Shoe and Bread Knives.	dis 20 & 10 @ 20 1/2
Hay and Straw.	See Hay Knives
Table and Pocket.	See Cutlery
Knobs.	
Door Mineral.	65¢ 75¢
Door Por. Jap'd.	75¢ 80¢
Door Por. Por. Nickel.	\$2.00 @ 2.25
Door Por. Plated Nickel.	\$2.00 @ 2.25
Drawer, Porcelain.	dis 55 & 10 @ 10 @ 6.10 @ 10 1/2
Hematite Door Knobs, new list.	dis 40 & 10 @ 50 1/2
Yale & Towne Wood Knobs, list Dec., 1885.	dis 40 & 10 @ 50 1/2
Furniture Plain.	75¢ gross inch. dis 10 1/2
Furniture, Wood Screws.	dis 25 & 10
Base, Rubber Tip.	dis 70 & 10 1/2
Picture, Judd's.	dis 60 & 10 @ 70 1/2
Picture, Sargent's.	dis 60 & 10 @ 10 1/2
Picture, Hematite.	dis 35¢ 38¢ 40¢
Shutter, Porcelain.	dis 65 & 10 1/2
Carriage, Jappanned.	* gross \$80, dis 60 & 10 1/2
Ladies.	
Melting, Sargent's.	* doz 55 & 10
Melting, Reading.	dis 55 & 10 1/2
Melting, Monroe's Patent.	* doz \$4.00, dis 40 & 10 1/2
Melting, P. S. & W.	dis 35 & 10 @ 40 & 10 1/2
Melting, Warner's.	dis 80 & 10 1/2
Lanterns.	
Flubar, No. 9, without Guards.	* doz \$5.75
Flubar, Liftwire, No. 0, without Guards.	* doz \$8.50
Flubar, Hinge Tip No. 0, without Guards.	* doz \$6.25
Flubar, Bottom Lift, without Guards.	* doz \$6.25
Flubar, U. S. Safety Lift Wire, no Guards.	* doz \$5.00
Judds, Small 40¢; add * doz.	
Porter, Small 40¢; add * doz.	\$10.00 dis 20 1/2
Lemon Squeeze.	
Porcelain Lined, No. 1.	* doz \$6.00, dis 25 & 30 1/2
Wood, No. 2.	* doz \$3.00, dis 35 1/2
Wood, Common.	* doz \$1.75, dis 35 1/2
Dunlap's Improved.	* doz \$1.75, dis 35 1/2
Sammons'.	* doz 1.25, dis 35 1/2
Jennings' "Star."	* doz \$2.50
The "Boss."	* doz \$2.50
Dean's.	* doz 1.25, dis 35 1/2
Little Giant.	* doz 50 @ 55 1/2
King.	* doz 40 & 5 1/2
Lines.	
Trotton and Linen Fish, Draper's.	dis 50 1/2
Draper's Chalk.	dis 60 1/2
Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.	dis 25 1/2
Trotton Chalk.	dis 55 1/2
Saxon Cotton, No. 2, \$2; No. 3, \$2.10; No. 4, \$2.50.	dis 10 1/2
Silver Lake, Braided, Nos. 0, \$0.00; No. 1, \$0.50; No. 2, \$0.75.	dis 25 1/2
Wilson's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00.	dis 25 1/2
Wire Cloth, No. 18, \$3.75; No. 19, \$4.25; No. 20, \$	

Syracuse Screw-Driver Bits.....	dis 30 & 30 $\frac{1}{2}$ ¢
Screw Driver Bits.....	\$ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.....	\$ gro. 6.25
Fray's Hol. Hdl. Sets, No. 3, \$12.....	dis 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....	dis 50 %
Screws	
Wood Screws—List, Brass, Jan. 27; Iron, July 1, 1887	
Flat Head Iron.....	dis 70 %
Round Head Iron.....	dis 65 %
Flat Head Brass.....	Ex. 10 % often given by jobbers.
Round Head Brass.....	dis 60 %
Flat Head Bronze.....	dis 65 %
Round Head Bronze.....	dis 60 %
Machinery	
Flat Head, Iron.....	dis 55 %
Round Head, Iron.....	dis 50 %
Bench and Hand—	
Bench, Iron.....	dis 55 & 10 @ 55 & 10 %
Bench, Wood, Beech.....	\$ doz. 2.25
Bench, Wood, Hickory.....	dis 20 & 10 %
Hand, Wood.....	dis 25 & 10 @ 25 & 10 %
Lag, Blunt Point.....	dis 60 % @ 60 %
Couch and Lag, Gimlet Point.....	dis 60 % @ 60 %
Bed.....	dis 25 %
Hand Rail, Barnason, Buckley & Co., s.....	dis 60 & 10 @ 60 & 10 %
Hand Rail, Am. Screw Co.....	dis 75 %
Jack Screws, Millers Falls list.....	dis 50 @ 50¢
Jack Screws, P. S. & W.....	dis 35 %
Jack Screws, Sergeant.....	dis 60 & 10 @ 60 & 10 %
Jack Screws, Stearns.....	dis 40 @ 40 & 10 %
Scroll Saws	
Lester, complete, \$10.00.....	dis 25 %
Rogers, complete, \$4.00.....	dis 25 %
Scythe Scraths	
American (Cast) Iron.....	dis 75 & 10 @ 75 & 10 %
Pruning—See Pruning Hooks and Shears	
Barnard's Lamp Trimmers.....	\$ doz. 8.75
Tinners.....	dis 20 & 2 %
Seymour's, List, Dec. 1881 dis 60 & 10 @ 60 & 10 @ 5 %	
Hinsch's, List, Dec. 1881 dis 60 & 10 @ 60 & 10 @ 5 %	
Hinsch's Tailor's Shears.....	dis 33¢
First quality C. S. Trimmers.....	dis 80 @ 80 & 10 %
Second quality C. S. Trimmers, dis 80 & 10 @ 80 & 10 @ 10 %	
Acme Cast Shears.....	dis 10 & 10 %
Diamond Cast Shears.....	dis 10 & 10 %
Clipper.....	dis 10 & 10 %
Victor Cast Shears.....	dis 75 & 10 @ 75 & 10 %
Howe Bros. & Hubert, Solid Forged Steel.....	dis 40 %
Cleveland Machine Co., Solid Steel Forged.....	dis 70 %
Sheaves	
Sledging Door	
M. W. & Co., list Jan. 1, 1887.....	dis 50 & 10 @ 60 & 5 %
R. E. & E. list Dec. 18, 1885.....	dis 55 & 2 %
Corbin's list.....	dis 60 & 10 & 2 %
Patent Roller.....	dis 60 & 10 & 2 %
Patent Roller, Hatfield's.....	dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885.....	dis 60 & 2 %
Moore's Anti-Friction.....	dis 60
Sliding Shutter—	
R. & E. list Dec. 18, 1885.....	dis 60 & 10 & 2 %
Sargent's list.....	dis 60 & 10 %
Reading list.....	dis 60 & 10 & 2 %
Ship Tools	
L. & J. White.....	dis 20 & 5 %
Albertson Mfg. Co.....	dis 25 %
Shoes, Horse, Mule, &c.	
Hoover's, Perkins', Phoenix, at factory.....	\$4.00
Mule—Add \$1 per keg to above prices.	
Ox Wrought	
Ton lots.....	\$ per 90
1000 lb. lots.....	\$ per 90%
500 lb. lots.....	\$ per 100
Shot —(Eastern prices, 2¢ off, cash, 5 days.)	
Drop, # bag, 25 lb.....	\$1.50
Drop, # bag, 5 lb.....	.35
Buck and Chilled, 25 lb. bag.....	\$1.75
Buck and Chilled, # 5-lb. bag.....	.40
Western prices, 2¢ off, cash, 4 days.	
Drop Shot, # bag, 25 lb.....	See Trade Report.
Buck and Chilled Shot, # bag, 25 lb.....	
Buck and Chilled Shot, # bag, 5 lb.....	
Shovels and Spades	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	dis 20 %
Note.—Jobbers frequently give 5 @ 7½ % extra on above.	
Griffith's Black Iron.....	dis 50 & 10 %
Griffith's C. S. Iron Cut Speed, R. Goods.....	dis 50 & 10 @ 60 & 5 %
Griffith's Solid Iron Cut Speed, R. Goods.....	dis 50 & 10 @ 60 & 5 %
Old Colony (Sanford Fork & Tool Co.).....	dis 20 %
St. Louis Shovel Co.....	dis 15 @ 15 & 7½ %
Hussey, Binn & Co.....	dis 15 @ 15 & 7½ %
Hubbard & Co.....	dis 20 & 20 & 7½ %
Lehigh Mfg. Co.....	dis 50 & 10 %
Payne, Peetbone & Son, list January, 1886.....	dis 30 %
Remington's (Lowman's Patent).....	dis 30 & 10 @ 40 %
Rowland's, Black Iron.....	dis 50 & 10 %
Rowland's Steel.....	dis 60 @ 60 & 5 %
Shovels and Tongs	
Iron Head.....	dis 60 & 10 @ 60 & 10 & 5 %
Brass Head.....	dis 60 & 10 & 10 %
Skeins, Thimble	
Western list.....	dis 75 @ 75 & 10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....	dis 20 %
Slives	
Buffalo Metallic, S. S. & Co., new list.....	dis 50 & 25 %
Barier Flour Sifters.....	\$ doz. \$2.00
Smith's Adjustable Sifters.....	\$ doz. \$2.25
Smith's Adjustable Milk Strainer.....	\$ doz. \$2.00
Smith's Adjustable F. & C. Strainer.....	\$ doz. \$1.75
Sieve, Wooden Rim—iron, Plated, Mesh 18, Nested, # doz.....	70¢ .90¢
Mesh 20, Nested, # doz.....	.85¢ \$1.00
Mesh 24, Nested, # doz.....	\$1.00 1.10
Slates —School, by case.....	dis 40 & 10 %
Snaps, Harness, &c.	
Anchor (T. & S. Mfg. Co.).....	dis 60 g
Fitch's (Bristol).....	dis 50 & 10 %
Hotchkiss.....	dis 10 g
Andrews.....	dis 50 g
Sargent's Patent Guarded.....	dis 70 & 10 @ 10 %
German, new list.....	dis 40 & 10 %
Cover.....	dis 50 & 2 %
Cover, New Patent.....	dis 50 & 5 & 2 %
Cover, New R. E.	dis 60 & 2 %
Covered Spring.....	dis 60 & 10 & 10 %
Soldering Irons	
Cover's Adjustable, list Jan. 1, 1886.....	dis 35 & 2 %
Spoke Shaves —Iron.....	dis 45 %
Wood.....	dis 30 %
Bailey's (Stanley R. & L. Co.).....	dis 40 & 10 %
Stearns'.....	dis 20 & 10 @ 30 %
Spoke Trimmers	
Bonney's.....	\$ doz. \$10.00, dis 50 %
Stearns'.....	dis 20 & 10 %
Ires'.... No. 1, \$15.00; No. 2, \$12.00 + doz, dis 55 & 10 %	
Douglas'.....	\$ doz. \$9.00, dis 20 %
Spoons and Forks	
Spun Iron	
Basting, Central Stamping Co.'s list, dis 70 & 70 & 10 %	
Solid Table and Tea, Central Stamping Company's list.....	dis 70 & 70 & 10 %
Buffalo, S. S. & Co.....	dis 33 & 42 %
Screws	
Wood Screws—List, Brass, Jan. 27; Iron, July 1, 1887	
Flat Head Iron.....	dis 70 %
Round Head Iron.....	dis 65 %
Flat Head Brass.....	Ex. 10 % often given by jobbers.
Round Head Brass.....	dis 60 %
Flat Head Bronze.....	dis 65 %
Round Head Bronze.....	dis 60 %
Silvers	
Silver-Plated —	
Meriden Brit. Co., Rogers.....	dis 50 & 5 %
C. Rogers & Bros.....	dis 50 & 5 %
Rogers & Bro.....	dis 50 & 5 %
Reed & Barton.....	dis 50 & 5 @ 50 & 10 & 5 %
Wm. Rogers Mfg. Co.....	dis 50 & 10 @ 60 %
Holmes & Edwards Silver Co.....	dis 50 & 10 & 10 @ 60 %
H. & E. Silver Co., Mexican Silver.....	dis 50 & 5 %
H. & E. Silver Co., Durham Silver.....	dis 50 & 5 %
German Silver.....	dis 50 @ 50 & 5 %
German Silver, Hall & Elton.....	dis 40 & 5 %
Nickel Silver.....	dis 50 & 5 @ 50 & 10 & 5 %, cash Britannia.....
	dis 55 %
Springs	
Elliptic, Concord, Platform and Half Scroll.....	dis 60 @ 60 & 5 %
Cliff's Bolster Springs.....	dis 20 %
Squares	
Steel and Iron.....	{ dis 70 & 10 %
Nickel-Plated.....	
Try Square and T Bevels.....	dis 60 & 10 @ 60 @ 70 %
Douston's Try Square and T Bevels.....	dis 45 & 10 %
Winterbottom's Try and Miter.....	dis 30 & 10 %
Staples	
Fence Staples, Galvanized.....	\$ doz. 4 @ 4 & 4¢
Fence Staples, Plain.....	\$ doz. 3 @ 3 & 4¢
Steelyards	
Stocks and Dies.....	dis 40 & 10 @ 50 & 5 %
Blacksmith's, Waterford Goods.....	dis 30 & 5 @ 30 & 10 %
Lightning Screw Plate.....	dis 25 & 25 @ 30 %
Reece's New Screw Plates.....	dis 33 & 3 @ 33 & 25 %
Stone	
Hindostan No. 1, 3¢; Axe, 3¢; Slips No. 1, 5¢.	
Sand Stone.....	\$ per lb.
Wasnita Stone, Extra.....	dis 15 @ 16 & 2¢
Wasnita Stone, No. 2.....	dis 11 @ 12 & 2¢
Wasnita Slips, No. 1, Extra.....	dis 20 @ 24 & 2¢
Wasnita Slips, No. 1.....	dis 30 @ 32 & 2¢
Arkansas Stone, No. 1, 4 to 6 in.....	dis 2, 3, 4 & 5 @ 31 & 2¢
Arkansas Stone, No. 1, 6 to 9 in.....	dis 1, 2, 3, 4 & 5 @ 31 & 2¢
Turkey Oil Stone.....	dis 4 to 8 in., \$ per lb.
Turkey Slips.....	dis 1, 2, 3, 4 & 5 @ 31 & 2¢
Lake Superior Slips, Chase.....	dis 1, 2, 3, 4 & 5 @ 31 & 2¢
Senece Stone, Red Paper Brand, \$ per lb.....	18 @ 20 & 2¢
Senece Stone, High Rounds, \$ per lb.....	20 @ 20 & 2¢
Senece Stone, Small Whets, \$ per gro.....	24.00
Stove Polish	
Joseph Dixon's.....	\$ gro. \$6.00, dis 10 %
Gem.....	\$ gro. \$4.50, dis 10 %
Gold Medal.....	\$ gro. \$6.00, dis 35 %
Mirror.....	\$ gro. \$6.00, dis 10 %
Lustro.....	\$ gro. \$4.75 net
Rising Sun, 5 gro. lots.....	\$ gro. \$5.50
Dixon's Plumabago.....	\$ gro. \$5.50
Boynton's Noon Day, \$ per gro.....	5.00
Parlor Pride Stove Enamel.....	\$ gross, \$13
Yates Liquid, 2, 3, 5, 10 gal. cans.....	dis 30 & 10 %
Yates, 2, 3, 5, 10 gal. cans, per gal.....	\$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-lb. cans, per lb., 15¢	
Jet Black.....	\$ gro. \$3.50
Japanese.....	\$ gro. \$3.50
Fire-side.....	\$ gro. \$2.50
Tacks, Brads, &c.	
List, Jan. 2, 1888.	
American Iron Carpet Tacks.....	dis 7½ & 10 & 2 %
Steel Carpet Tacks.....	dis 7½ & 10 & 2 %
American Iron Cut Tacks.....	dis 7½ & 10 & 2 %
Swedes Iron Tacks.....	dis 7½ & 10 & 2 %
Swedes Iron Upholsterers Tacks.....	dis 6½ & 10 & 2 %
Tinned Swedes Iron Tacks.....	dis 6½ & 10 & 2 %
Tin'd Swedes Iron Upholsterers Tacks.....	dis 6½ & 10 & 2 %
Gimp and Lace Tacks.....	dis 6½ & 10 & 2 %
Tinned Gimp and Lace Tacks.....	dis 6½ & 10 & 2 %
Swedes Iron Miners' Tacks.....	dis 6½ & 10 & 2 %
Swedes Iron Bill Posters' or Railroad Tacks.....	dis 6½ & 10 & 2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....	dis 6½ & 10 & 2 %
Copper Tacks.....	dis 7½ & 10 & 2 %
Copper Finishing Trunk and Clout Nails.....	dis 33 & 21 & 10 & 2 %
Finishing Nails.....	dis 60 & 10 & 2 %
Tinned Trunk and Clout Nails.....	dis 60 & 10 & 2 %
Basket Nails.....	dis 60 & 10 & 2 %
Common and Patent Brads.....	dis 60 & 10 & 2 %
Hungarian Nails.....	dis 6½ & 10 & 2 %
Chair Nails.....	dis 6½ & 10 & 2 %
Zinc Glaizers' Points.....	dis 4½ & 10 & 2 %
Cigar Box Nails.....	dis 4½ & 10 & 2 %
Picture-Frame Points.....	dis 4½ & 10 & 2 %
Looking-Glass Tacks.....	dis 4½ & 10 & 2 %
Leathered Carpet Tacks.....	dis 4½ & 10 & 2 %
Brush Tacks.....	dis 4½ & 10 & 2 %
Brush Finders.....	list Jan. 2, 1888, dis 10 @ 10 & 10 & 2 %
Lining and Sadou Nails, List Jan. 1, 1886.....	dis 30 & 10 & 10 %
Japaned.....	dis 20 & 10 & 10 %
Double-pointed Tacks.....	dis 85 %
Wire Carpet Nails.....	dis 50 & 10 & 10 %
Stell' Wire Brads, R. & E. Mfg. Co.....	dis 50 & 10 & 10 %
Tap Borers	
Common and Ring.....	dis 20 & 10 %
(See Tap Borers)	dis 33 & 25 %
Enterprise Mfg. Co.....	dis 20 & 10 @ 30 %
Clark's.....	dis 35 % @ 35 %
Temps., Measuring —American.....	dis 25 & 20 %
Spring.....	dis 25 & 20 %
Chestermans'.....	Regular list dis 25 & 30 %
Thermometers —Tin Case.....	dis 80 @ 80 & 10 %
Thimble Skeins—See Skeins	
Ties, Haled.....	
Steel Wire, Standard list.....	dis 50 & 10 & 2 %
Shears and Snips (P. S. & W.).....	dis 20 @ 25 %
Punches—See Punches	
Snips, J. Mallinson & Co.....	dis 33 & 25 %
Tinware	
Stamped, Japanned & Pieced, list Jan. 20, 1887.....	dis 70 @ 70 & 10 & 2 %
Reiher's, 70 & 10 @ 70 & 10 %	
All Iron.....	dis 50 & 2 %
Nashua Lock Co.'s.....	dis 50 & 2 %
Wilson's.....	dis 55 %
Clipper (Sargent & Co.).....	dis \$24, dis 50 & 10 & 10 %
Acme.....	dis \$20.00, dis 40 & 10 %
Transom Lifters	
Wollensak's Patent Iron Bronzed.....	dis 50 %
Reiher's Bronze Iron Rods list Jan. 1, 1887, dis 50 & 2 %	
Reiher's Real Bronze or Nickel Plate, list Jan. 1, 1887.....	dis 50 & 2 %
Excelsior.....	dis 50 & 10 & 2 %
Shaw's.....	dis 50 & 10 %
Payson's Universal.....	dis 40 & 10 %
Crown and Star.....	dis 50 %
Traps	
Newhouse.....	dis 30 @ 40 & 25 %
Oneida Pattern.....	dis 60 & 10 & 10 @ 70 %
Game, Blake's Patent.....	dis 60 & 10 & 10 %
Mouse and Rat	
Mouse, Wood, Choker.....	\$ doz holes, 11 & 12
Wrought Goods	
Staple Hooks, &c., list Jan. 12, 1887, dis 80 & 20 & 85 & 10 %	

CURRENT METAL PRICES.

FEBRUARY 8, 1888.

IRON AND STEEL.**Bar Iron from Store.**

Common Iron:	
3/4 to 2 in. round and square	per lb. 2.10 @ 2.20¢
1 to 6 in. x 3/4 to 1 in.	per lb. 2.25 @ 2.40¢
4 1/2 to 6 in. x 3/4 to 1 in.	per lb. 2.45 @ 2.60¢
1 to 6 in. x 3/4 and 5-16	per lb. 2.35 @ 2.50¢
Rods—3/8 and 11-16 round and sq.	per lb. 2.50 @ 2.60¢
Bands—1 to 6 x 3-16 to No. 12.	per lb. 2.50 @ 2.60¢
"Burden's Best" Iron, base price	per lb. 3.00 @ ...¢
Burden's "H. & S." Iron, base price	per lb. 2.80 @ ...¢
"Ulster"	per lb. 3.10 @ ...¢
Norway Rods	4.00 @ 5.00¢

Sheet Iron from Store.

Common American. R. G. Cleaned.	
10 to 16. per lb. 2.75 @ 2.80¢	3.25 @ ...¢
17 to 20. per lb. 2.85 @ 3.00¢	3.25 @ 3.50¢
21 to 24. per lb. 3.00 @ 3.10¢	3.50 @ ...¢
25 and 26. per lb. 3.20 @ 3.30¢	3.75 @ ...¢
27. per lb. 3.75 @ 3.87 1/2¢	4.00 @ ...¢
28. per lb. 3.50 @ ...¢	4.00 @ ...¢
B. B. 2d qual.	
Galvanized, 14 to 20.	per lb. 4.80 @ 4.50¢
Galvanized, 21 to 24.	per lb. 5.20 @ 4.87 1/2¢
Galvanized, 25 to 26.	per lb. 5.60 @ 5.25¢
Galvanized, 27.	per lb. 6.00 @ 5.62 1/2¢
Galvanized, 28.	per lb. 6.40 @ 6.00¢
Patent Planished.	per lb. A 10¢ B. 9¢
Russia.	per lb. 9 1/2¢ @ 10¢
American Cold Rolled B. B.	per lb. 5¢ @ 7¢

STEEL.—Duty. Ingots, Bars, Sheets, &c., valued at 4¢ per lb or less, 45% ad val.; valued above 4¢ and not above 7¢ per lb, 2¢ per lb; valued above 7¢ and not above 10¢ per lb, 2¢ per lb; valued above 10¢ per lb, 3¢ per lb. Extras—Steel Bars, Rods, &c., cold hammered or polished in any way in addition to ordinary hot rolling, 1 1/4¢ per lb in addition to above; Steel Circular Saw Plates, 1¢ per lb in addition to the above.

Chrome Steel.

Tool Steel, ordinary sizes 3/8 to 8 inches. net.	
Adamantine Shoes and Dies.	
Magnet Steel.	

English Steel from Store.

Best Cast. per lb	
Extra Cast. per lb 16 1/2 @ 17 ¢	
Swaged, Cast. per lb 16	
Best Double Shear. per lb 15 ¢	
Blister. 1st quality. per lb 12 1/2¢	
German Steel, Best. per lb 10 ¢	
2d quality. per lb 9 ¢	
3d quality. per lb 8 ¢	
Sheet Cast Steel, 1st quality. per lb 15 ¢	
2d quality. per lb 14 ¢	
3d quality. per lb 12 1/2¢	

METALS.

Tin. per lb	
Banca, Pigs. 38 @ 38 1/2¢	
Straits, Pigs. 38 @ 38 1/2¢	
English, Pigs. 39 @ 40 ¢	
Straits in Bars.	

Tin Plates.

Charcoal Plates.—Bright. per box.	
Melyn Grade. IC, 10 x 14.	\$6.50
IC, 12 x 12. 6.75	
IC, 14 x 20. 6.50	
IC, 20 x 28. 13.00	
IX, 10 x 14. 8.00	
IX, 12 x 12. 8.25	
IX, 14 x 20. 8.00	
IX, 20 x 28. 16.00	
DC, 12 x 17. 6.00	
DX, 12 1/2 x 17. 7.50	
Calland Grade. IC, 10 x 14. 6.00	
IC, 12 x 12. 6.25	
IC, 14 x 20. 6.00	
IX, 10 x 14. 7.50	
IX, 12 x 12. 7.75	
IX, 14 x 20. 7.50	
Allaway Grade. IC, 10 x 14. \$5.25 @ 5.50	
IC, 12 x 12. 5.50 @ 5.75	
IC, 14 x 20. 5.25 @ 5.50	
IC, 20 x 28. 10.75 @ 11.00	
IX, 10 x 14. 6.50 @ 6.75	
IX, 12 x 12. 6.75 @ 7.00	
IX, 14 x 20. 6.50 @ 6.75	
IX, 20 x 28. 12.75 @ 13.00	
DC, 12 x 17. 5.00 @ 5.25	
DX, 12 1/2 x 17. 6.00 @ 6.25	

Coke Plates—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20. \$5.50 @ \$5.10	
10 x 20. 7.50 @ 8.00	
20 x 28. 10.00 @ 10.25	
IX, 10 x 14, 14 x 20. 6.00	
BV Grade.—IC, 10 x 14, 14 x 20. 5.00	

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20. \$4.75	
20 x 28. \$9.25 @ 9.50	
IX, 14 x 20. 5.75	
20 x 28. 11.50	
Abecarne Grade.—IC, 14 x 20. \$4.50 @ 4.65	
20 x 28. 9.00 @ 9.25	
IX, 14 x 20. 5.50 @ 5.75	
20 x 28. 11.00	

Tin Boiler Plates.

Per pound.	
XXX, 14 x 26. 112 sheets. 6¢	
XXX, 14 x 28. 112 sheets. 6¢	
XXX, 14 x 31. 112 sh.ets. 6¢	

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 45% ad valorem.

Ingot.

Lake. 17.50¢ @ 18¢

"Anchor" Brand. 16.50¢ @ 17¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

Weights per square foot and prices per pound.

Not wider than	Over 64 oz.					
	Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.
30—72	35	35	25	25	25	31
30—96	35	35	25	25	25	34
36—96	35	35	25	25	25	35
48—96	35	35	25	25	25	36
50—96	35	35	25	25	25	37
Over 84 in. wide	35	35	31	31	31	38

Sizes.	Double.				
	1st.	2d.	3d.	4th.	
E F H D	E F H D	E F H D	E F H D	E F H D	
25	6 x 8 to 10 x 15.	10.50	\$12.50	\$12.00	\$11.50
40	11 x 14 to 16 x 24.	16.00	15.00	14.50	14.50
50	18 x 22 to 20 x 30.	20.50	19.50	18.50	18.50
54	15 x 36 to 64 x 30.	22.00	20.75	19.50	19.50
60	26 x 28 to 24 x 36.	25.00	23.00	21.50	21.50
70	26 x 36 to 26 x 44.	26.00	25.00	24.50	24.50
80	26 x 46 to 30 x 50.	21.00	19.50	18.00	18.00
84	30 x 52 to 30 x 54.	22.00	20.25	19.00	19.00
90	36 x 56 to 34 x 56.	23.00	21.25	20.00	20.00
94	34 x 58 to 34 x 60.	24.00	22.75	21.00	21.00
100	36 x 60 to 40 x 60.	20.50	24.50	23.00	23.00

Sizes above—\$15 per box extra for every 5 inches discount—70¢ & 10¢ & 5¢.

AMERICAN GLASS.**Price Per Box of 50 Feet.**

United Inches.	Single.				
	AA	A	B	C	
25	6 x 8 to 10 x 15.	\$10.50	\$9.00	\$8.50	\$8.00
40	11 x 14 to 16 x 24.	11.20	10.75	10.25	9.75
50	18 x 22 to 20 x 30.	15.50	14.00	13.00	12.50
54	15 x 36 to 24 x 30.	16.50	15.00	14.50	14.50
60	26 x 28 to 24 x 36.	17.75	16.25	14.75	14.75
70	26 x 36 to 26 x 44.	19.00	17.50	15.25	15.25
80	26 x 46 to 30 x 50.	21.00	20.00	19.50	19.50
84	30 x 52 to 30 x 54.	22.00	20.25	19.00	19.00
90	36 x 56 to 34 x 56.	23.00	21.25	20.00	20.00
94	34 x 58 to 34 x 60.	24.00	22.75	21.00	21.00
100	36 x 60 to 40 x 60.	20.50	24.50	23.00	23.00

United Inches.	Double.				
	AA	A	B	C	
25	6 x 8 to 10 x 15.	\$13.00	\$12.50	11.00	\$10.00
40	11 x 14 to 16 x 24.	16.00	15.00	13.50	12.00
50	18 x 22 to 20 x 30.	20.50	19.50	18.00	17.50
54	15 x 36 to 24 x 30.	22.00	20.75	18.75	18.75
60	26 x 28 to 24 x 36.	25.00</td			